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Abstracts of 151 studies completed in agricultural education during the 1963-65 academic years are included in this annotated bibliography. Criteria used by the research committee of the Agricultural Education Division of the American Vocational Association in selecting studies for publication were: (1) The study contributed significantly to the solution of problems in agricultural education, (2) The study employed an adequate design, used appropriate procedures, and involved sufficient data which were effectively summarized and resulted in justifiable conclusions, (3) The study has been published in a professional journal, is available for loan from a university library, or is available from a state department of education, and (4) The study reported staff research or research submitted as a thesis or dissertation for a graduate degree. Only those studies were included in which inferences were drawn applicable to areas or regions broader than local communities. Each abstract contains a bibliographic entry, the purpose of the study, the method, and findings. Studies are indexed by subject areas. [Not available in hard copy due to marginal legibility of original document.] (CH)

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SUMMARIES OF STUDIES IN AGRICULTURAL EDUCATION

1963-1965

A Project of the
American Association of Teacher Educators in Agriculture

Compiled and Edited by
Research Committee
Agricultural Education Division
American Vocational Association

Order from
THE INTERSTATE PRINTERS & PUBLISHERS, INC.
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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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INTRODUCTION

Summaries of Studies in Agricultural Education is a familiar title. Teachers, supervisors, teacher educators, graduate students, librarians and others interested in research in agricultural education have considered it the standard reference for research in agricultural education for over 30 years. Since 1935, abstracts of research compiled by the Research Committee of the Agricultural Education Division, American Vocational Association, have been published periodically by the U. S. Office of Education as supplements to Vocational Division Bulletin No. 180 under the title Summaries of Studies in Agricultural Education. Supplement No. 16, including abstracts of studies completed through 1962-63, is the last supplement in the series to be published by the U. S. Office of Education.

With the publication of this edition of Summaries of Studies in Agricultural Education, The American Association of Teacher Educators in Agriculture continues the publication of abstracts of research in agricultural education. Abstracts of 151 studies completed during the 1963-64 and 1964-65 academic years are included. The consecutive numbering system for abstracts followed in previous publications is continued. This publication includes abstracts of studies numbered 3,249 through 3,399. The studies are indexed by abstract number rather than by page number.

Criteria used by the Research Committee in selecting studies for this publication were as follows:

-- The study contributed significantly to the solution of problems in agricultural education.

-- The study employed an adequate design, used appropriate procedures, and involved sufficient data which were effectively summarized and resulted in justifiable conclusions.

-- The study has been published in a professional journal, is available for loan from a university library, or is available from a state department of education.

-- The study reported staff research or research submitted as a thesis or dissertation for a graduate degree. Only those studies were included in which inferences were drawn applicable to areas or regions broader than local communities.

Members of the Research Committee of the Agricultural Education Division, American Vocational Association, at the time these abstracts were compiled were: Gene M. Love, The Pennsylvania State University (now at the University of Missouri), Chairman; J. Robert Warmbrod, University of Illinois (now at The Ohio State University), Secretary; Richard A. Baker, Auburn University; C. Oscar Loreen, Washington State University; and Paul Day, NVATA. They were assisted in compiling the studies by H. Neville Hunsicker, U. S. Office of Education, and by the following former members of the Research Committee: Earl S. Webb, Texas A & M University; Joel H. Magisos, Washington State University; James D. McComas, New Mexico State University; Glenn Z. Stevens, The Pennsylvania State University; and Gordon I. Swanson, University of Minnesota.

Gene M. Love assumed the major responsibility for final editing and preparing the manuscript for publication.

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SUMMARIES OF NEW STUDIES, 1963-65

3249. AKERS, JOHN GARLAND. Administrators' Opinions Regarding Selected Policies for Vocational Agriculture. Thesis, M.S., 1963, Kansas State University. 47 p. Library, Kansas State University, Manhattan.

Purpose.--To gather information about vocational training and the experience of school administrators in south central Kansas schools as well as their opinions regarding (1) curriculum, (2) subject matter, (3) organization of classes, (4) teachers, (5) student development, and (6) use and financing for vocational agriculture. The study also proposed to determine whether the opinions of the selected administrators followed definite patterns.

Method.--The data were obtained by interviews with administrators in the south central Kansas schools which had vocational agriculture departments at the time of the study.

Findings.--Eighty-two percent of the administrators in the study had no formal training in vocational education. Of this group, 59 percent felt that they should have had special vocational education and 14 percent had taught vocational subjects. The formal training of the others ranged from 3 to 48 semester hours. The administrators' experience with vocational education ranged from 1 year to 28 years. Average tenure at the present position was just over 6 years.

School enrollments ranged from 62 to 1,125. Approximately 10 percent of all students were enrolled in vocational agriculture.

Eighty-six percent of the administrators considered vocational agriculture as an integral part of the secondary school program; seventy-two percent considered young farmer and adult programs as an integral part of the total school program. Sixty-eight percent said that there should be a minimum and a maximum size class in vocational agriculture; the average for the minimum was 8 students and the maximum was 20 students.

Seventy-two percent of the administrators felt that teaching vocational agriculture should be a full-time responsibility for one person, 50 percent felt that there should be a required course of study outline in the fall.

A majority of the administrators felt that vocational agriculture helped students to think, study, and develop ability to solve problems. They did not require students to take vocational agriculture. A majority felt that college-bound students interested in agriculture should take vocational agriculture.

The administrators believed that a majority of the vocational agriculture departments met the needs of the community and needed a budget for operation, that vocational agriculture was a costly program, but that the development and teaching of students justified the high cost. A majority said that it did not cost any more than other shop programs.

3250. ALLGOOD, EARL V. Prediction of Academic Success of Freshman Students in Three Divisions at Virginia State College. Thesis, D.Ed., 1964, The Pennsylvania State University. 104 p. Library, The Pennsylvania State University, University Park.

Purpose.--To determine relationships between five pre-admission variables and first semester averages of freshman students at Virginia State College to establish a selective admission policy, and to use the pre-admission variables and four placement tests to develop regression equations and probability tables for the counseling of students.

Method.--Data for all freshman students in the three academic divisions of the college for the 1960-61, 1961-62, and 1962-63 school years were used. The pre-admission variables were high school rank, sex, percent of high school class going to college, SCAT verbal scores, and SCAT quantitative score for eleventh-grade students. The post-admission variables were two standardized verbal tests and two mathematics tests. Multiple regression equations were developed.

Findings.--The findings indicated that predictions from the data of the three academic divisions (land-grant, liberal arts, and teachers) combined were as accurate as differential predictions by separate divisions. For selective admission of first semester students, high school rank (X_1), School and College Ability Test for Eleventh Grade Students, verbal score (X_4), and School and College Ability Test for Eleventh Grade Students, quantitative score (X_5) were the best variables. The three measures accounted for 38.9 percent of the variability in first semester grade point averages. The regression equation based upon the 1962-63 data for students in the combined divisions was:

$$Y = .196X_1 + .021X_4 + .035X_5 - .519$$

In the formulation of regression equations to be used in construction of probability tables for the counseling of freshman students, the findings indicated that high school rank (X_1), SCAT, verbal score (X_4), SCAT, quantitative score (X_5), and Cooperative English Test, Mechanics of Expression score (X_6) were the best variables. The four measures accounted for 40.1 percent of the variability in first semester grade point averages. The regression equation based upon the 1962-63 data for students in the combined divisions was:

$$Y = .171X_1 + .014X_4 + .033X_5 + .004X_6 - .650$$

The use of tables of probability of academic success prepared from regression equations developed from data on pre-admission variables for a recent previous freshman class can enhance the objectivity of a selective admission program at Virginia State College. The counseling of new students can be aided by predictions of academic success based on a combination of the significant pre-admission and placement measures.

3251. AL-SALMAN, MUHSIN HUSSAIN. The Role of Prevocational Agriculture in the Junior High Schools of New York State. Dissertation, Ph.D., 1965, Cornell University. 135 p. Library, Cornell University, Ithaca.

Purpose.--(1) To provide a description of prevocational agriculture offered in the various junior high schools in New York State, and (2) to determine what selected educators in agriculture believe the objectives and course content should be.

Method.--A list of 17 objectives and a list of 103 items of course content were assembled and prepared in the form of questionnaires. Items for course content were grouped into nine subject areas. A jury of 17 members was selected. The jury was asked first to rank the 17 objectives and then to respond to the 103 items of course content. Twenty-two teachers of vocational agriculture were randomly selected and asked to respond to the items of course content. Both jury members and teachers of vocational agriculture expressed their judgment along a four-point scale. Composite rank order was used to establish the importance of objectives of prevocational agriculture.

Findings.--Responses of the jury members to the 17 objectives revealed that they considered the following objectives as the most important: (1) to acquaint pupils with a few of the agricultural problems, career possibilities, and sources of information; (2) to provide opportunities for pupils to explore the extent and importance of farming and related agricultural occupations in a community; and (3) to help pupils develop understanding of and appreciation for the importance of agriculture not only to themselves as producers and consumers but also to the country's present and future.

Responses of the jury and teacher groups on the 103 content items revealed that they differed both within the groups and between the groups.

3252. ALVIS, THOMAS V. The Effect of Various Levels of Vocational Agriculture in High Schools on Academic Achievement of Freshman Agriculture Students at Texas A & M University in 1963-64. Thesis, M.S., 1964, Texas A & M University. 36 p. Agricultural Education Library, Texas A & M University, College Station.

Purpose.--To compare the academic achievement of students with high school backgrounds in vocational agriculture with the academic achievement of students who did not have a high school background in vocational agriculture.

Method.--Data were taken from the permanent files in the office of the director of instruction for the College of Agriculture at Texas A & M University. The academic achievement of students with various levels of training in vocational agriculture in high school was compared with the achievement of students who had no vocational agriculture in high school. The following variables were considered: (1) units of science and mathematics in high school, (2) high school quartile, (3) college of agriculture grade point ratio, (4) grades made in Biology 101, (5) grades made in Chemistry 101, and (6) grades made in Mathematics 102.

Findings.--Students who took vocational agriculture in high school performed at the same level in the College of Agriculture as students who had no vocational agriculture in high school. Students who had vocational agriculture entered college with an equivalent number of credits in mathematics and science as those who had taken no vocational agriculture in high school. Students with chemistry credits from high school earned significantly higher grades in chemistry courses in college. Taking vocational agriculture in high school did not significantly affect academic achievement as indicated by the variables studied. The data seemed to warrant the recommendation that students who plan to enroll in the College of Agriculture at Texas A & M University should take chemistry in high school.

3253. AMBERSON, MAX LEE. A Study of Reimbursement Policies and Their Effect Upon Program Development in Vocational Education. Thesis, M.A., 1965, University of Minnesota. 75 p. Library, University of Minnesota, St. Paul.

Purpose.--To find out what reimbursement policies were being used in vocational and technical education in selected States and determine their relative effectiveness.

Method.--A survey form was mailed to the Director of Vocational Education in each selected State. The three areas studied were: (1) The status of the State vocational staff by division. (2) The progress in State vocational education measured by change in numbers of programs, their enrollments, and similarly by levels (high school, post-high school, and adult) at which such instruction was given. (3) Program development compared with reimbursement policies employed by the States.

A jury was used to identify reimbursement principles being used to determine their individual and aggregate effect on program development.

Findings.--Several reimbursement policies were being used by different States. Only two major reimbursement principles were involved. They were the school foundation fund principle and the special fund reimbursement principle. The school foundation fund principle showed the largest percentage increase in its effectiveness to increase enrollment while the special funds reimbursement principle showed the largest percentage increase in schools offering vocational programs.

The school foundation funds principle showed the greatest percentage increase in the number of schools offering vocational programs in agriculture, technical trades, and industrial education and the largest percentage increase in numbers of programs and enrollments at the high school and post-high school levels. The special funds reimbursement principle showed the largest percentage increase in numbers of schools offering vocational programs in distributive education and at the adult level.

3254. ANDERSON, ROBERT L. Factors Influencing Attendance in Adult Farmer Classes in Vocational Agriculture. Thesis, M.Ed., 1964, Colorado State University. 65 p. Department of Vocational Education, Colorado State University, Fort Collins.

Purpose.--To discover what factors influenced regular attendance at adult instructional classes in vocational agriculture in Districts II and III in eastern Nebraska.

Method.--Data were obtained from adult farmer class members in Districts II and III of Nebraska through responses to a questionnaire.

Findings.--The most frequently checked response factors found to influence attendance of the respondents at adult farmer classes were: (1) family situations, (2) climatic or road conditions, (3) instructional program, (4) farm work or other occupations, (5) social and fraternal obligations, (6) civic activities, and (7) church activities.

The adult farmers' interests in the teaching methods and techniques employed in the instructional program were classified into three interest groups by weighting responses. Items of "High Interest" were: (1) discussion of farm problems with other members, (2) knowledge gained, (3) special speakers or instructors, and (4) audio-visual presentation. Items of "Medium Interest" were: (1) demonstrations, (2) lectures, (3) process of mental stimulation, (4) social aspects of the program, (5) community-school relationships, and (6) publicity on class activities. Items of "Lesser Interest" were: (1) tours and visits, (2) recreational aspects of program, (3) on-farm-supervision by teacher, and (4) panels or symposia.

The major suggestions for improving attendance were: (1) include more specific technical agricultural course content, (2) publicize meetings more widely, (3) use more outside speakers, and (4) schedule class instructional topics in advance.

3255. ANTHONY, FRANK. A Comparison of Methods of Teaching Firearm and Hunting Safety in Selected Pennsylvania Schools. Staff Study, 1964, Bulletin 711, The Pennsylvania State University. 20 p. College of Agriculture, Agricultural Experiment Station, University Park.

Purpose.--(1) To identify instructional problem areas for beginning hunters (ages 12-16) which involve firearm education and safe hunting practices, (2) to develop teaching aids in firearm and hunting safety education to be used in instruction of elementary and secondary schools, and (3) to compare the effectiveness of various methods of presentation in teaching hunting safety.

Method.--A teaching experiment was conducted with 2,912 students in the 7th and 8th grades in 13 Pennsylvania schools. Different methods of presenting firearm and hunting safety information were randomly assigned to schools for each method. A criterion test of 50 items entitled "An Attitude Inventory for Beginning Hunters" was constructed from the "Ten Commandments of Shooting Safety." The students were given the attitude inventory before and after being taught by an assigned method. Four basic methods of instruction were:

Method 1. Photographic slide presentation with a script read by a teacher and a lecture-demonstration by a game protector.

Method 2. Lecture-demonstration by a game protector.

Method 3. Lecture by a teacher using a prepared text.

Method 4. Photographic slide presentation with a script read by a teacher.

Findings.--All four methods of instruction, each used in two schools, were effective in changing the attitudes of beginning hunters when all students were considered. Methods 1, 3, and 4 were superior to Method 2. Girls had lower pretest scores, but their final scores were as high as those of the boys. Similarly, the scores of 7th grade students were lower initially and after instruction were not different from 8th grade students.

A variation in dress of the game protector was used with Method 2 in a supplementary experiment in two schools. Game protectors in civilian dress were more effective in changing attitudes than the same persons in official uniform. It was found by use of Method 4 in three additional schools that local classroom teachers can be used effectively in teaching firearm and hunting safety.

3256. ANTHONY, FRANK, BRISTOL, B. K., and KIMMEL, O. A. The On-Farm Service Center in Mechanized Farming. Staff Study, 1964, The Pennsylvania State University. 38 p. Department of Agricultural Education, The Pennsylvania State University, University Park.

Purpose.--To determine basic information for the development of models for on-farm service centers, power and small tools, and machinery storage sheds necessary to operate and maintain farm machinery and other equipment on a modern mechanized dairy farm.

Method.--In western Pennsylvania 34 small, medium, and large dairy farms were surveyed and compared with models constructed for each size farm.

Findings.--Only 7 of the 34 farms had on-farm service centers. The rest reported substitute facilities which were rated very low by their owners on such factors as space, location, light, heat, and ventilation requirements. The medium size farms (20-39 cows) with service centers averaged 82 percent of the floor area specified in the model while the large farms (40 cows and over) had 45 percent of the area specified for an on-farm service center. For farmers to store all of their farm machines under roof, storage sheds 32' x 64' are recommended for small farms, 32' x 88' for medium farms, and 32' x 100' for large farms.

According to the suggested models for service centers, tools, and storage sheds on the three sized farms, the farmers have not as yet improved their buildings and related facilities in order to conduct an adequate preventive maintenance program. The low ratings given their present layout and facilities by the farmers add further justification for the models recommended in this study. There are definite differences in needs on the small, medium, and large dairy farms. Specific items and sizes are listed in the report.

3257. BAIL, JOE PAUL. Agricultural Education at the High School Level in Arizona. Staff Study, 1965, University of Arizona. 20 p. Department of Agricultural Education, University of Arizona, Tucson. 0

Purpose.--To develop a list of guidelines for use in modifying and improving programs in agricultural education to serve the needs of high school youths.

Method.--Procedures and techniques for conducting the study were developed with the assistance of an advisory committee of 15 leaders in agriculture and education. Data used in the study were obtained from 7 groups of selected people acquainted with the program of vocational agriculture, through conference, interview, and questionnaire. The groups sampled included: (1) school administrators, (2) teachers of vocational agriculture, (3) guidance counselors, (4) school board members, (5) parents of agriculture students, (6) former students, and (7) other individuals acquainted with the program. Responses were received from 276 persons concerning 31 items on proposed program changes or modifications relative to: (1) courses to be offered, (2) experiences programs, and (3) role of the FFA.

Findings.--The opinions of respondents to the questionnaire were summarized under the headings: (1) consistent acceptance of the statements, (2) consistent rejection of statements, and (3) inconsistent responses. Findings included: (1) course content and class schedules should be planned to meet the needs of all students (including college-bound students) interested in agriculture; (2) introductory courses should include basic principles of science related to agriculture; (3) facilities for essential occupational experience in agriculture should be provided jointly by the school and the home, and work experience performed under the supervision of the teacher of agriculture should extend throughout the calendar year; and (4) FFA activities should be related to agriculture, should be an integral part of the program of instruction, and should be available to any student enrolled in agriculture. From the findings, lists of course titles in agriculture were suggested for: (1) small high schools (less than 200 enrollment); (2) medium size high schools (200 to 500 enrollment); (3) large rural, urban, or suburban high schools; and (4) large city high schools.

Types of courses in the suggested lists include such titles as: (1) agricultural science, (2) animal science, (3) agricultural mechanics (one and two), (4) gardening, (5) horticulture, (6) ornamental horticulture, and (7) nursery management.

3258. BAILEY, JOSEPH KENNA. Non-Farm Agricultural Employment in West Virginia, with Implications for Vocational Education Programs. Dissertation, Ph.D., 1964, Ohio State University. 202 p. Library, College of Agriculture, Ohio State University, Columbus.

Purpose.--To appraise the non-farm agricultural employment in West Virginia and provide a basis for projecting agricultural education programs to serve that sector of the labor force. Inherent in the appraisal was a census of the number and kinds of agencies employing agricultural workers and the number and types of agriculturally oriented positions and occupations.

Method.--The State in toto constituted the universe for a census of non-farm agricultural occupations. Data were collected by personal interview from responsible officers or personnel in agencies likely to be employing persons who would classify as agricultural workers. Agricultural education personnel surveyed all counties in the State and conducted the interviews. To achieve maximum uniformity in the census, workshops were conducted to train interview personnel.

A second segment of the study involved the analysis of the census data. A pilot program was planned to serve as a guide for the later development of statewide programming.

Findings.--Interviews with representatives of those firms, businesses, organizations, industries, and services considered to be employers of agricultural workers revealed that 1,717 such agencies employed a total of 13,851 non-farm agricultural workers. This employment constituted 3.6 percent of the total labor force in West Virginia. This, coupled with a farm employment of 20,775, or 5.4 percent of the labor force, gave a total agricultural employment of 34,605, or 9 percent of the labor force. A close ratio of non-farm agricultural workers was found to exist both on an area and State basis.

Non-farm agricultural employment was distributed in eight categories: Forestry, 33.2 percent; Livestock and Poultry Industries, 18.1 percent; Farm Supply and Equipment, 12.8 percent; Agricultural Service, 10.3 percent; Ornamental Horticulture, 9.7 percent; Wildlife and Recreation, 6.0 percent; Produce Industry, 6.0 percent; and Farm Service, 4.0 percent. All categories revealed a significant number of employment opportunities with implications of need for vocational education programs to serve the non-farm agricultural sector of the labor force.

3259. BARWICK, RALPH P. Identification of Off-Farm Agricultural Occupations and the Education Needed for Employment in These Occupations in Delaware. Thesis, D.Ed., 1965, The Pennsylvania State University. 195 p. Library, The Pennsylvania State University, University Park.

Purpose.--(1) To identify present and emerging off-farm agricultural occupations that require agricultural competencies, (2) to estimate the number of persons currently employed in these occupations, (3) to estimate the number to be employed in the future, and (4) to determine competencies needed in selected occupational families.

Method.--A list of 2,053 businesses, services, and agencies in which it was thought a knowledge of agriculture would be useful or helpful was compiled. A disproportionate random sampling method was used to draw a sample of 267 businesses or services. The data were collected by personal interviews and grouped into eight occupational families for reporting.

Findings.--There were 32,776 persons employed in the 2,053 off-farm agricultural businesses and services. This was approximately 20 percent of the persons employed in the State excluding farming. Of the 32,766, 5,050 were found to need agricultural competencies. It was estimated, therefore, that 3.1 percent of the total number of employed workers in the State, excluding farming, need training in agriculture.

The two occupational families that had the greatest number of employees needing agricultural competencies were Food Marketing and Distribution and Ornamental Horticulture. During the next 5-year period following this survey it was estimated the number of employees needing agricultural competencies will increase by 17.7 percent. The greatest needs for employees will be in Food Marketing and Distribution and Ornamental Horticulture.

3260. BEARD, HARRY G. A Study of the Meaning of Selected Program Planning Concepts in Vocational Education. Thesis, D.Ed., 1965, Cornell University. 108 p. Library, Cornell University, Ithaca.

Purpose.--To measure the meaning assigned by local school personnel to new program planning concepts in vocational education in North Carolina. Differences in meaning were determined (1) between a new and a comparable traditional concept, (2) between the cluster of new concepts and the cluster of traditional concepts, and (3) between the cluster of new concepts and a cluster of concepts on experimentation and inservice education which were proposed as having a requisite relationship to the new program planning concepts. The new concepts studied were "a local plan for vocational education," "introduction to vocations," and "revised vocational agriculture curriculum." Comparable traditional concepts, respectively, were "a local plan for vocational agriculture," "introduction to agricultural occupations," and "vocational agriculture I, II, III, and IV." The requisite concepts were comprised of "research in vocational education," "pilot programs in vocational education," and "inservice education."

Method.--A "semantic differential" was constructed and administered to a 20 percent random sample of teachers of agriculture in North Carolina to elicit judgments on the meaning of the program planning concepts. Judgments were elicited for the factors of meaning of "evaluation," "potency" and "oriented activity." The semantic differential was administered to subjects in group interviews. Comparisons by individual concepts for each factor of meaning employed the *t*-test. The Wald-Wolfowitz two-sample runs test was used to make comparisons by cluster of concepts.

Findings.--On the basis of the meaning of individual concepts, it was found that: (1) there were no differences in the meaning assigned to the new concept, "a local plan for vocational education," and the traditional concept, "a local plan for vocational agriculture," indicating that unified local planning in all occupational fields and for all vocational education services, and local planning on the traditional basis are equally good, strong, and active; (2) there were differences in the meaning assigned to the new concept, "introduction to vocations," and the traditional concept, "introduction to agricultural occupations," indicating that unified efforts in instructional vocational guidance and counseling through a course called introduction to vocations were poorer, weaker, and less active than the traditional approach to guidance and counseling in vocational agriculture; and (3) there were differences in meaning assigned to the new concept, "revised vocational agriculture curriculum," and the traditional concept, "vocational agriculture I, II, III, and IV," indicating that beginning with a general agriculture course followed by occupational speciality courses was better, stronger, and more active than the traditional content organization of vocational agriculture I, II, III, and IV.

On the meaning of concepts by cluster, it was found that: (1) There were no differences in the meaning assigned to the cluster of new concepts and the cluster of traditional concepts, and (2) There were no differences in the meaning assigned to the cluster of new concepts and the cluster of requisite concepts. These findings indicate a lack of differentiation in meaning between the cluster of new concepts and the cluster of traditional concepts, and a general compatibility in meaning of the cluster of new concepts and the cluster of requisite concepts. Actually, it was found that a closer semantic relationship existed between the new and traditional concepts and between the new and requisite concepts than existed among the new concepts.

3261. BEEKS, JOHN C. Pre-College Experiences as Preparation for College Courses in Agronomy. Dissertation, Ed.D., 1964, University of Missouri. 117 p. Library, University of Missouri, Columbia.

Purpose.--To determine the knowledge of agronomy possessed by entering freshmen in the College of Agriculture at the University of Missouri. An additional purpose was to determine if agricultural experiences had an effect on knowledge of agronomy and if the knowledge was sufficient to justify granting credit by examination.

Method.--A testing instrument was constructed consisting of 100 multiple choice items, each with four alternatives. The instrument was divided into two similar sections. One was for material presented in the course, Field Crops I; the other was for material used in Introduction to Soil Science. The testing instrument was administered in the required course, Agriculture in the Economy, during the years 1962 and 1963. A total of 310 usable answer sheets were obtained. The population was grouped into ten categories: (1) those with vocational agriculture, (2) those without vocational agriculture, (3) those with 4-H, (4) those without 4-H, (5) those with farm experience, (6) those without farm experience, (7) those with vocational agriculture but no 4-H, (8) those with 4-H but no vocational agriculture, (9) those with no agricultural experience, and (10) those with one or more of the agricultural experiences.

Findings.--Students without agricultural experience had significantly higher means on the School and College Ability Test than those with agricultural experience. Students with more than one year of vocational agriculture were better prepared in agronomy than those students without such experience. Students with more than one year of 4-H experience were better prepared in soils but not necessarily better prepared in field crops. Students who had lived on a farm for more than two years were better prepared in agronomy than students without this experience. Students with experience in vocational agriculture but no 4-H, were better prepared in agronomy than students with 4-H but no vocational agriculture. Students with any one of the experiences in agriculture were better prepared in agronomy than students with no experience in agriculture. About 48 percent of the former students of vocational agriculture scored above 70 percent on the examination. Nine percent of non-vocational agriculture groups scored above 70 percent. Thirty-eight percent of the students with farm experience scored above 70 percent on the examination compared to about six percent of the non-farm group. Students with agricultural experiences appeared to have less ability than students without agricultural experiences as measured by the School and College Ability Test. Despite lower college ability, students with agricultural experiences were better prepared to participate in the basic courses of agronomy than students without such experiences. A substantial number of students demonstrated the ability necessary to be granted credit by examination if such a program were provided.

3262. BENEKER, FLOYD D. The Realization of Plans by 1957 Male High School Graduates in Five Wisconsin Counties as Measured by a Comparison of Residential, Occupational, and Educational Classification. Thesis, M.S., 1964, University of Wisconsin. 105 p. Department of Agricultural and Extension Education, University of Wisconsin, Madison.

Purpose.--To assess the realization of occupational aspirations of 1957 graduates of five representative Wisconsin counties. A secondary but interrelated purpose was to determine migration of respondents from the home community to obtain a job or further their education.

Method.--The group studied consisted of the 1957 male graduates of the following five Wisconsin counties: Adams, Iowa, Manitowoc, Polk, and Price. Data from 538 respondents were studied. Data were gleaned from a series of four questionnaires which had been administered between December 1956 and August 1963. Percentages and arithmetic means were used to analyze the data. Chi square was used for several relationships to determine significance of differences.

Findings.--More farm youth had not received formal education beyond high school than non-farm youth. The non-farm group had more individuals who had completed or were pursuing college educations and vocational training than the farm residence group.

Indecision about staying in the home community was very prevalent even two years after graduation. Nearly half of the respondents were undecided about staying in their home community. It was determined that by 1963, 56.9 percent of the respondents had migrated from the home community. Migration for the farm and non-farm group was essentially the same.

Manitowoc county retained the largest percentage of its respondent population and Polk county had the lowest retention. Manitowoc county is highly industrialized. Polk county is near the Minneapolis-St. Paul, Minnesota industrial area.

County-to-county migration within the State accounted for the largest number of migrants. It was followed by out-of-state, intra-county, and out-of-county migration in that order.

A large portion of the migrants had some college experience or vocational training. Sixty-four percent had some form of formal education beyond high school.

Over three-quarters of the respondents considered their jobs permanent. Less than one-third of the respondents had attained the occupation which was their ten year goal. In 1958 the respondents were asked what occupation they wanted to be in by 1968. The lowest realization of occupational desires occurred in the classifications of manager, officials, and proprietors; sales and clerical; and professional, technical and kindred.

A much larger proportion of the respondent population was engaged in skilled, semi-skilled, and unskilled occupations than had desired to be by 1968. A much larger proportion of the population aspired to professional, technical, and kindred occupations than national employment levels in this classification.

The number of respondents actively engaged in farming in 1963 amounted to 25 individuals or 36 percent of those who hoped to be farming by 1968. When compared to national figures the proportion of the study population engaged in farming was still over twice the size of comparable national figures.

3263. BENNETT, WILLIAM C. Competencies in Soil Management and Use of Fertilizers Needed by Farmers. Thesis, M.S., 1965, Iowa State University of Science and Technology. 91 p. Library, Iowa State University of Science and Technology, Ames.

Purpose.--To determine the competencies in soil management and use of fertilizers needed by farmers and the extent to which the farmers possessed the competencies.

Method.--A panel of 15 specialists developed a list of 46 competencies, 24 related to soil management and 22 related to the use of fertilizer. The list, in questionnaire form, was submitted to 314 farmers who had been named outstanding farmers by the Iowa Junior Chamber of Commerce. Each farmer indicated the degree each competency was needed and possessed using a 10 point scale. Data from the first 200 usable questionnaires received were used in the study.

Findings.--Mean scores for needed competencies ranged from 4.1 to 7.1, while mean scores for possessed competencies ranged from 3.6 to 6.4. The highest ranked competency for both the degree needed and degree possessed was the responsibility for maintenance of soil productiveness for future generations. The mean needed score for this competency was 7.1. The ranked mean scores for each of the other top ten competencies were as follows: (2) control of weeds and soil insects, 7.0; (3) develop a farm plan for maximum use of soil resources, 6.9; (4) economic principles in soil management, 6.9; (5) balanced nutritional needs of crops, 6.8; (6) safety in transfer of liquid and anhydrous fertilizer from bulk storage to the applicator, 6.8; (7) the understanding of fertilizer nutrients, grades and labeling, 6.8; (8) plan an economical fertilization program, 6.8; (9) proper use of fertilizer in good soil management, 6.8; and (10) economic principles of fertilization, 6.7.

A comparison of the ten most highly ranked needed competencies and control variables resulted in three being significantly correlated at the one percent level. They were: educational level of the operator and the economic principles of fertilization; gross income, $10,000 increments, and balanced nutritional needs of crops; and educational level of operator and plan an economical fertilization program.

The need for additional training for present farm operators is evident when the outstanding farmer group indicated a need for more competence than they possessed in 44 of the 46 competencies that were identified and evaluated.

3264. BENTLEY, RALPH R. Factors Influencing the Vocational Choices of Agriculture College Freshmen. Staff Study, 1963, Studies in Education, No. 4, Purdue University. 51 p. Department of Education, Purdue University, Lafayette.

Purpose.--To investigate the influence of selected factors on the vocational choices of freshmen agriculture college freshmen in seven midwest universities.

Method.--Students completed a questionnaire by indicating whether each of 36 factors influenced them "a great deal," "little," or "not at all," (1) in their choice of agriculture as a career, and (2) in their choice of a field of specialization in agriculture. The students were asked to select 5 of 16 factors they believed to be most important in a job.

The data, obtained from 1,540 students were categorized by (1) university, (2) years of experience in selected activities, and (3) field of specialization in agriculture. Chi square was used to determine whether there were significant differences among the responses of students as categorized and percentages were computed to show the relative amount of influence students in the various categories attributed to each of the selected factors.

Findings.--In general, factors influencing most agriculture college freshmen with respect to their choice of agriculture as a career, likewise influenced most students with respect to their choice of a field of specialization in agriculture. Persons influencing the largest percentage of freshmen were fathers, mothers, teachers of agriculture, and friends. Significantly more freshmen were influenced by teachers of agriculture than by any other professional person. The factors influencing most freshmen were categorized as "Work and Farm Experiences," and "Vocational Factors." In general, the more experience agriculture college freshmen had had in vocational agriculture, FFA, and 4-H Club, the more influence they attributed to teachers of vocational agriculture, vocational agriculture, FFA, and 4-H Club activities.

When student responses, regarding the relative influence that each of the 36 factors had on their choice of agriculture as a career, were categorized by universities, significant chi square differences were found for 6 and 22 factors at the .05 and .01 levels, respectively. When student responses, regarding the relative influence that each of the 36 factors had on their choice of a field of specialization in agriculture were categorized by universities, significant chi square differences were found for 8 and 14 factors at the .05 and .01 level, respectively. Opportunity factors selected by more than 40 percent of the freshmen, as one of five most important factors in a job, in order of importance, were as follows: "to earn money," "to use your own ideas," "for continuous employment," "to be your own boss," "to do a variety of work," "to do good for others," and "for advancement." Student responses by universities, with respect to factors selected as one of the five most important in a job, were significantly different for nine of the sixteen opportunity factors.

3265. BICE, GARRY ROBERT. Information Concerning Off-Farm Agricultural Occupations in New York State. Thesis, M.S., 1965, Cornell University. 153 p. Mann Library, Cornell University, Ithaca.

Purpose.--The purpose of the study was to obtain first-hand information concerning the off-farm agricultural occupations in the 260 school districts offering instruction in agriculture in the State of New York and in two school districts within the Adirondack Area. Eight questions were listed for which answers were sought.

Method.--A stratified-random sample of school districts offering instruction in agriculture was utilized. Representatives of businesses or services, whose employees used agricultural competencies, were interviewed in each of eighteen school districts.

Findings.--For this study 594 different businesses or services and 289 different job titles were located, and 54 job titles were described in detail. Information reported for each of the job titles included: (1) corresponding Dictionary of Occupational Titles code number, (2) nature of work and areas of competency needed, (3) level of employment and personal qualifications, (4) method of advancement, (5) wages, and (6) estimate of future employment.

3266. BINGHAM, WILLIAM R. Agricultural Occupations Other Than Farming in Selected Kentucky Counties With Implications for Vocational Education. Dissertation, Ed.D., 1965, University of Kentucky. 250 p. Library, University of Kentucky, Lexington.

Purpose.--To secure answers to questions concerning agricultural occupations other than farming which are needed in adjusting present programs and developing new programs of vocational education to meet the occupational requirements of people entering and progressing in such occupations.

Method.--Eight trade areas strategically located throughout Kentucky were selected. Five types of agricultural businesses were studied. In each area a sample of each type of business was drawn.

Personal interviews were used to secure information in 111 businesses: 49 farm-supply, 30 farm-machinery, 24 nursery, 5 agricultural-chemical, and 3 livestock-marketing. One key representative of each business was interviewed regarding the nature of the business, employment opportunities, job descriptions, and educational requirements for job entry and advancement. Interviewees described each job title in their respective businesses. They indicated the activities and necessary competencies for each job title, educational level for job entry, and the preferred background of employees.

Vocational agriculture available in Kentucky, philosophy of vocational education, and related studies and literature were reviewed. This review provided a basis for the implications for vocational education in the conclusion.

Findings.--Most of the jobs identified used people with formal education at the high school level. Therefore, occupational orientation, guidance, and appropriate vocational education in the broad field of agriculture must be provided in high school.

Additional vocational education in agriculture is also needed at the post-high school level. Jobs in agriculture are becoming more technical. Employers are demanding employees with specific skills. The number of people available for specialized education is limited in some local schools. In these cases technical programs to prepare people for job entry need to be provided by area schools.

Certain activity and competency areas are significant, generally throughout agricultural occupations. These areas should be emphasized in vocational programs in high school to develop occupational ability with wide application. Some activity areas with wide application are contacting people, selling, using manuals, maintaining and operating machines, handling money, keeping records, and filing. Widely applicable competency areas include fertilizers, crop production, insect and disease control, nutrition and rations, and operating tractors and machines.

Farm experience is very helpful for successful entry and advancement in agricultural occupations. Provision should be made for boys and girls to benefit from their farm experience in vocational education and employment. Prior work experience is also very helpful. Students should be assisted in gaining meaningful work experience to develop desirable work habits.

3267. BOBBITT, JOHN FRANKLIN. The Relationship of Participating Experiences in Student Teaching to Comparable Experiences Engaged in by Teachers of Vocational Agriculture. Thesis, M.S., 1964, Virginia Polytechnic Institute. 97 p. Library, Virginia Polytechnic Institute, Blacksburg.

Purpose.--The purposes were (1) to determine the relationship of the participating experiences of certain student teachers with experiences engaged in by the same individuals at a later time, (2) to determine which of the experiences in which the student teachers participated were being used by vocational agriculture teachers, and (3) to determine the participating experiences that needed more or less emphasis during student teaching.

Method.--Data were secured by questionnaire from 61 vocational agriculture teachers who were graduated from Virginia Polytechnic Institute during the years 1951 through 1961 and from six area supervisors of vocational agriculture in Virginia.

Findings.--There was a positive relationship between the emphasis placed on the participating activities during student teaching and the degree to which the teachers were using the same activities on the job. All activities receiving adequate emphasis during student teaching were being satisfactorily performed by the teachers of vocational agriculture on the job.

Of the 15 areas in which participating experiences were required 9 were adequately emphasized during student teaching. The remaining 6 areas were inadequately emphasized during student teaching. Of the 15 required areas of participating experiences the activities in 13 were being performed satisfactorily by teachers on the job.

3268. BODENHAMER, SCHELL H. A Study of the Effects of Presenting Informative Speeches With and Without the Use of Visual Aids to Voluntary Adult Audiences. Dissertation, Ph.D., 1964, The Ohio State University. 197 p. Library, The Ohio State University, Columbus.

Purpose.--(1) To determine the comparative amount of learning that took place in informal, voluntary, adult audiences when an informative speech was presented with and without the use of visual aids. (2) To determine the difference in the way the informal, voluntary, adult audiences reacted introspectively to the effectiveness of a meeting where visual aids were or were not used in the presentation of an informative speech.

Method.--A 20-minute speech was developed on "The Weather." Visual aids were prepared. The speech was presented at 46 meetings. At 23 of the meetings the speech was presented supplemented with visual aids. At the other 23 meetings the same speech was presented without visual aids. Audiences were randomly divided. The investigator conducted all the meetings. Controls were used to assure identical physical facilities and arrangements.

A multiple-choice test was given to measure immediate recall after the speech presentations. Also, a questionnaire was used to determine the differences in introspective reactions.

Findings.--Major findings were: (1) Adult audiences presented an informative speech supplemented with visual aids learned significantly more, as measured by immediate recall, than did adult audiences presented the same informative speech without visual aids. (2) Adult audiences perceived an informative speech supplemented with visual aids as being at a significantly higher level of effectiveness than the same speech presented without visual aids.

3269. BOERINGA, GEORGE B. Vocational Agriculture Training in Federal Correctional Institutions. Thesis, M.S., 1963, Washington State University. 51 p. Holland Library, Washington State University, Pullman.

Purpose.--(1) To determine the extent and values of vocational and general agriculture training in Federal correctional institutions. (2) To identify the types of training provided, the methods of instruction used, teacher qualifications, facilities needed, the place of the training program, the institutional organization, and further program possibilities.

Method.--Data were obtained from questionnaires mailed to 27 Federal correctional institutions.

Findings.--Agricultural operations aid in the economical operations of most institutions as a major source of food for prison population and as a means of utilizing a sizeable portion of inmate labor. Organized training programs were used for the benefit of inmates when released, as a means of improving the quality of the inmate labor force, to improve work habits, and to improve attitudes in self realization through the development of natural interest. Related training, related information, and classes were used extensively to support on-the-job training.

General agriculture classes and various methods of individual study were used to a lesser degree. The teaching personnel were primarily farm staff members. Vocational agriculture instructors were used and highly desired to assist farm staff members and teach general agriculture classes. Methods of instruction used were those which were most readily adaptable to heterogeneous groups, allowing for their individual differences. Budget allowances came from education and farm budgets. Few programs had been discontinued and many prison administrators reported that agriculture training programs were of real value.

3270. BOOKER, WILLIAM E. College Freshmen Drop-outs in Agriculture at Alabama Agricultural and Mechanical College, Normal, Alabama, 1957-1962. Thesis, M.Ed., 1965, Colorado State University. 62 p. Library, Colorado State University, Fort Collins.

Purpose.--To discover the factors that influenced freshman students to drop out of the Division of Agriculture.

Method.--The study included 55 freshmen male students who had dropped out of the Division of Agriculture at Alabama Agricultural and Mechanical College during the school years 1957-1962. Data for the study were obtained from a survey by means of a questionnaire, personal interviews, and college records.

Findings.--The five major factors influencing students to drop from the Division of Agriculture in descending order of importance were: (1) subject matter too difficult, (2) requested to leave school by school authorities, (3) financial problems, (4) personal adjustment poor, (5) lure of job. The factors: (1) home sickness, (2) love problems, (3) transferred to another college, and (4) death in the family were not factors of any consequence in influencing the drop-outs.

Of the 55 respondents, only 8 had continued their education in a college or university after dropping out of agriculture. Only one had transferred to another college.

3271. BRONSON, CLEMENT A. An Evaluation of Selected Aspects of Agricultural Education Programs in the Inter-Regional Land-Grant Institutions of the United States. Dissertation, Ph.D., 1963, The Ohio State University. 565 p. Library, The Ohio State University, Columbus.

Purpose.--To ascertain the factors necessary to appraise the educational programs of the departments of agricultural education, to evaluate the teacher training programs as to their degree of helpfulness in preparing teachers of vocational agriculture, and to discover the strengths and the weaknesses and to determine changes needed in programs of agricultural education.

Method.--Data were taken from the literature of the various offices and authorities who had been responsible for development of teacher training in vocational education in agriculture. From these statements a preliminary draft of a statement of position on each of ten selected aspects was developed and sent to fifteen head teacher trainers who served as a jury of experts.

A modified draft from the returns of the preliminary draft, together with a questionnaire and an evaluation schedule was resubmitted for final adoption by the jury of experts. The response was 100 percent. The agricultural education departments studied included fourteen inter-regional land-grant departments and one quasi land-grant department.

Findings.--There was general agreement among head teacher trainers as to the major objectives of the agricultural education programs in inter-regional land-grant departments. These objectives were: (1) recruiting trainees, (2) the training curriculum, (3) placement of teachers, (4) inservice teacher education, (5) research, (6) administration and supervision, (7) the staff, (8) instruction, (9) institutional facilities, and (10) public relations activities.

The Guiding Statements of Positions identified in the study and which subsequently led to formulation of the evaluative criteria were operationally sound as a basis for evaluating the current programs of agricultural education departments.

The weakest areas of the total program of agricultural education departments were: (1) research, (2) recruiting trainees, and (3) public relations activities. The strongest areas in the total program were: (1) the staff, (2) the training curriculum, and (3) institutional facilities.

The general status of these departments reflected that: (1) there were needs for increases in teacher training and secretarial personnel, (2) there was a need for a massive cooperative research program among agricultural education departments of the several states with the objective of improving total programs and solving reciprocal problems related to vocational agricultural education, and (3) there was a need for developing a systematic internal departmental evaluation program within each department.

3272. BROWN, WILLIAM JASPER, JR. Socio-Economic Values in Relation to Tobacco Yields. Thesis, M.Ed., 1964, North Carolina State University. 42 p. Library, North Carolina State University, Raleigh.

Purpose.--To determine if the socio-economic values of innovation proneness, economic motivation, rural life preference, and primary group relations were related to the tobacco yields of farmers.

Method.--Farmers with either high or low yields of tobacco per acre were selected to respond to a profile inventory which measured the values to be tested. Chi square was used to determine the significance of relationships.

Findings.--The values tested were related to the yields of tobacco per acre but at different levels of significance. High values of innovation proneness and rural life preference were significantly related to high yields of tobacco per acre. High values of economic motivation were not significantly related to high yields of tobacco per acre. There was a tendency for farmers with high yields to have high values on economic motivation. Primary group relations were not significantly related to tobacco yields per acre. But farmers, with high tobacco yields, did tend to have lower values on primary group relations. While values on economic motivation and primary group relations were not significantly related to tobacco yields, they were associated with yields at a level that would warrant some consideration.

3273. BRUCE, HERBERT H., JR. A Study of Factors Related to the Enrollment of High-School Boys in Vocational Agriculture in Kentucky. Dissertation, Ed.D., 1965, University of Kentucky. 187 p. Library, University of Kentucky, Lexington.

Purpose.--To determine why some boys who had an opportunity for supervised practice did not enroll in agriculture and why others who did not have an opportunity for supervised practice did enroll.

Method.--Freshman and junior boys in high school, teachers of agriculture, and guidance counselors were asked to supply information for this study. Three questionnaires were used to collect the data.

The first questionnaire was sent to all freshman and junior boys in 45 high schools. It was designed to determine if high school boys who had an opportunity for supervised farm practice were enrolled in vocational agriculture. The second questionnaire was to determine why boys who had opportunities for supervised practice did not enroll in agriculture and why boys who did not have opportunities for supervised practice did enroll. The third questionnaire was to secure information on practices and procedures used by teachers of agriculture, guidance counselors, principals, and other in enrolling boys in agriculture.

Findings.--Certain practices were followed in the schools which were most successful in enrolling boys in agriculture who had an opportunity for supervised practice. The following practices caused a higher percentage of students to enroll:

(1) Boys who were interested in agriculture and could arrange for supervised practice were encouraged to enroll; (2) Beginning students and their parents were visited, and the program of vocational agriculture was explained to them; (3) The counselor, principal, teacher of agriculture, other teachers, and parents were involved in counseling boys; (4) Information was secured on prospective students; (5) The schools' policies were more lenient in enrolling freshmen than juniors; (6) The final decision on enrolling boys was made by the teacher of agriculture; (7) Counselors helped principals work out the class schedules; (8) The vocational agriculture program was publicized; (9) Key people were used to contact prospective boys; (10) The potential ability of boys to benefit from vocational agriculture was determined; (11) Boys interested in vocational agriculture who could arrange for a farming program, even though their fathers were not farming, were enrolled; (12) The teachers of agriculture were optimistic about the future of agriculture; and (13) More curriculums were available in the most successful schools.

3274. BURTON, ROGER STANLEY. Employment Opportunities with Twenty-seven Agricultural Machinery and Major Farm Equipment Concerns in Delaware County, New York. Thesis, M.Ed., 1964, Cornell University. 53 p. Library, Cornell University, Ithaca.

Purpose.--(1) To locate the companies and the job opportunities available, (2) to determine the level of competency required for these jobs, (3) to survey the expressed needs of employers concerning the occupational education of their employees, (4) to compile a brief history of the background and education of selected employees, (5) to find patterns of entry into the occupations studied, (6) to find patterns of advancement in the occupations studied, (7) to survey employee expressions of their education needs for entry and advancement, (8) to determine employer attitude regarding future role of vocational agriculture in preparing for their employee needs, (9) to determine employer's expressions about present educational training for employees they are hiring, (10) to find employer's expressions about the present educational system and how well its graduates adapt to jobs, (11) to determine present employment problems that have implications for future vocational agricultural or vocational training programs, (12) to determine some projections for boys getting training with or without high school training, and (13) to gather information which would have implications regarding teaching methods.

Method.--All agricultural machinery and major equipment dealers in Delaware County were enumerated. Dealerships considered to be in the "fringe area" were added because they serviced farms in the county or hired employees from the county. Dealers were contacted during the summer of 1963 and throughout the 1963-64 school year. A two-page questionnaire was used to gather information for the study. Each of the 27 dealers was personally interviewed by the researcher.

Findings.--Each business averaged about seven employees. Most employees were classified as skilled or technical people. Sales and services were considered to be the major functions of each business.

Over 83 percent of the dollar volume of each dealership was agricultural in nature. Of the employers 92 percent indicated that 85 percent of their full-time employees and 73 percent of their part-time employees should have some agricultural competencies.

Remarks made by persons interviewed are summarized as follows: (1) Most of their employees need a general background in agriculture or a knowledge of the field. (2) There is a need for training in selling agricultural equipment. (3) There is a need for more technical training in agricultural mechanics. (4) Mechanical aptitude, sincerity, trustworthiness, work experience, and ability to talk the farmer's language were rated by dealers as the most desirable employee qualities. (5) There is a real need for more salesmen and mechanics. (6) Automobile salesmen did poorly in most cases when hired by machinery dealers to sell farm equipment. (7) Teachers should teach more maintenance and repair skills. (8) Vocational agriculture is not given the same status as "academic" courses in the dealer's community. (9) State and national regulations are often barriers to employers who would have offered work experience to students.

3275. BYRAM, HAROLD M. Development and Demonstration of Procedures for Evaluation of a Comprehensive Program of Vocational Education in the Public Schools. Michigan State University. Staff Study, 1965, Michigan State University. 57 p. ER-32, Bureau of Research Services, College of Education, Michigan State University, East Lansing.

Purpose.--(1) To develop a generalized procedure for making an evaluation in a public school system, (2) to utilize and further test the recommendations of the MVEEP study in light of local community conditions, and (3) to assist selected public school systems to evaluate and replan their programs of vocational education.

Method.--Three Michigan schools which offered broad programs were selected to cooperate in the study. All had administrative personnel, faculties, and local citizens who were interested in conducting an evaluation. All had adequate leadership for the project. In each of the three schools, an administrator was appointed to direct the evaluation and to organize local staff and advisory committees; a consulting committee cooperated with the State project director. The evaluation involved follow-up studies, placement procedures, needs studies, curriculum analyses, and teacher-guidance counselor relations. The local staff participated in open-house visits to each school and engaged in self-evaluation conferences with consultants.

Findings.--(1) A generalized procedure for evaluating local programs was developed; (2) The recommendations of the Michigan Vocational Education Evaluation Project that were deemed appropriate were tested and in some instances demonstrated; (3) All three schools evaluated their programs and made significant changes in them; (4) Several evaluation instruments were developed.

3276. CARDOZIER, V. R. Undergraduate Academic Achievement and Teaching Performance. Staff Study, 1965, University of Maryland. 68 p. Agricultural Experiment Station, University of Maryland, College Park.

Purpose.--To determine the relationship between achievement in undergraduate study, both in toto and in selected disciplines, and performance.

Methods.--The study was based on a 25 percent cluster sampling of 1959 and 1960 graduates in agricultural education of institutions in the United States. N equalled 188 teachers.

Undergraduate academic achievement was taken from each teacher's transcript. Measures of teaching performance were based on ratings by the teachers' principals and district supervisors of vocational agriculture, using a condensation of Sledge's scale for rating vocational agriculture teachers.

Relationships were determined with an adaptation of the Pearson product moment coefficient of correlation formula and tested with a t-test. Differences between groups of teachers, based on ratings, were determined with F and chi square tests.

Findings.--One of the objectives was to determine whether teacher performance differed when teachers were grouped into low, middle, and high groups according to undergraduate academic achievement. Based on analysis of variance, no differences were found except when teachers were grouped according to achievement in speech and student teaching. In order to evaluate achievement in speech and student teaching they were divided into two groups, instead of three, because most of them had received only one mark in each course. In speech and student teaching, those who had received higher marks were rated, for the most part, higher as teachers by their principals and supervisors.

3277. CARGILL, RICHARD F. An Examination of the Policies of Colleges of Agriculture Governing Their Relationships with High School Vocational Agriculture. Thesis, M.S., 1963, Washington State University. 41 p. Holland Library, Washington State

University, Pullman.

Purpose.--To examine the policies of 11 western land-grant colleges regarding the relationship of the College of Agriculture to high school vocational agriculture departments.

Method.--Two questionnaires were prepared, one for the Deans of the Colleges of Agriculture and one for the State Supervisors of Vocational Agriculture. The questionnaires identified 15 areas of concern and posed questions relating to these areas.

Findings.--There was a general agreement of cooperation between the Deans of Colleges of Agriculture and State Supervisors of Vocational Agriculture. Colleges of Agriculture gave their cooperation and assistance to the high school vocational agriculture program and provided the opportunity for vocational agriculture instructors to seek professional improvement and to keep up with technical advances in agriculture. A majority of the Colleges of Agriculture and high school vocational agriculture departments were experiencing neither a decrease in enrollment nor a decrease in the quality of the students. High school vocational agriculture does play an important part in recruiting College of Agriculture students. There is a need for the College of Agriculture to feel more responsibility for training teachers of vocational agriculture and for the success of the teachers.

3278. CHRISTENSEN, VIRGIL EARL. Factors Influencing Acquisition and Retention of Learning in Vocational Agriculture. Thesis, Ph.D., 1964, University of Wisconsin. 459 p. Library, University of Wisconsin, Madison.

Purpose.--The purpose of this study was to determine the effect individual differences, differences in home-farm situation, and differences in a student's supervised farming experience program had upon acquisition and retention of learning in vocational agriculture classrooms.

Method.--A random sample of ten percent of all Wisconsin high schools offering vocational agriculture was selected. A pretest, post-test, retention test design was then followed using as subjects the 481 sophomore students distributed throughout 33 Wisconsin high schools. The procedure followed was, (1) To determine each student's ownership and degree of experience with swine, (2) To obtain information about their individual differences and home and supervised farming experiences, (3) To have them participate in a classroom instructional unit on swine care and management, (4) To measure their gain in knowledge upon completion of the unit, and (5) To measure their retention of swine knowledge 150 days after the post-test. The teaching objectives investigated included: (1) The ability to learn and retain facts and figures, (2) The ability to learn and retain scientific and technological information, and (3) The ability to learn and apply the techniques of problem solving.

The following fifteen student classifications, with several stratifications within each classification, were used as the study independent variables: ownership or non-ownership of swine, Henmon-Nelson Test of Mental Ability raw scores, Clanin Experience Scale raw scores, interest in farming, number of swine owned, student's favorite farm animal, student's career preference, major income enterprise of home farm, size of home farm in acres, opportunity to farm afforded the student by the home farm, size of farm swine enterprise, rank of swine as a favorite farm animal to the student and his father, amount of time the student's father worked off the farm, and the attitude of the students' parents toward the vocational agriculture program.

The basic procedural design in the study was for the researcher to manipulate the independent variable (student classifications) and observe how the dependent variable (achievement test scores) changed.

Findings.--The major findings were that: (1) Student ownership, per se, without qualification as to number owned, is not a meaningful expression where acquisition and retention are concerned; (2) Experience had greater influence on acquisition than on retention; (3) Level of occupational aspiration was a reflection of ability and an influential factor in learning in the vocational agriculture classroom; (4) Aptitude had greater influence on total classroom acquisition and retention than did any other factor considered; (5) A direct relationship existed between the amounts acquired and retained and the parental attitude toward the school vocational agriculture program; (6) A good to excellent opportunity to farm appeared essential if the student was to approach maximum classroom learning and retention; (7) Acquisition and retention of fact and figure information depended more upon prior experience than upon student aptitude; (8) Acquisition and retention of scientific and technological information depended more upon aptitude than upon prior knowledge of other experience factors; (9) Problem solving ability as measured in this study depended more upon student aptitude level than any other factor considered, (10) The largest measured gains of knowledge were made in facts and figures, and (11) The highest measured retention was of scientific and technological information and in problem solving scores.

3279. CLARY, JOSEPH RAY. Guidelines for the Development of Training Programs for Agricultural Technicians. Dissertation, Ph.D., 1964, The Ohio State University. 309 p. Library, The Ohio State University, Columbus.

Purpose.--The major purpose was to develop guidelines for use in planning and conducting training programs for agricultural technicians. An effort was made (1) to determine the status and characteristics of present training programs for agricultural technicians, (2) to determine the degree of emphasis administrators of present programs believe should be given to certain procedures in developing successful training programs, and (3) to synthesize, refine, and evaluate a tentative set of guidelines for use in planning and conducting training programs for agricultural technicians.

Method.--This was a national study limited to public institutions at the post-high school level, excepting 4-year colleges, with organized curricula designed for the preparation of agricultural technicians. Instruments were prepared by the investigator to secure data on the status and characteristics of present training programs for agricultural technicians in institutions identified with the help of State directors of vocational education. A structured check-list was used to record degrees of emphasis which should be given to certain procedures in the development of successful programs. A tentative list of guidelines and supporting statements were synthesized from an extensive review of literature on training programs for technicians. These were revised and evaluated by a national jury of leaders in technical education fields.

Findings.--Institutions with training programs for agricultural technicians were classified into four general categories: technical institutes, junior colleges, comprehensive community colleges, and area vocational-technical schools. A total of 59 training programs for agricultural technicians in 25 institutions were identified. A number of new programs were in the planning stages.

Guidelines and supporting statements were synthesized, refined, and evaluated in the following areas: (1) objectives of the program; (2) types of programs offered; (3) curriculum content; (4) recruitment; (5) student services (selection, counseling, placement and follow-up, and residence facilities); (6) library; (7) instructional staff; (8) facilities and equipment; (9) acceptance by industry, business, and educational leaders; (10) evaluation; (11) accreditation and/or licensing; and (12) location.

3280. COKER, LARRY D. An Analysis of Future Farmer of America Agricultura Contests in West Texas. Thesis, M.S., 1963, Texas Technological College. 71 p. Library, Texas Technological College, Lubbock.

Purpose.--The purpose was to analyze and to appraise judging contests in vocational agriculture Areas 1 and 11 in west Texas.

Method.--Questionnaires were returned by 114 vocational agriculture teachers in west Texas.

Findings.--Among the teachers 91 percent believe that the alternates should be allowed to participate in the contests. Of the teachers 47 percent desired to add a farm mechanics contest, 26 percent desired to add a range management contest, and 28 percent wanted an entomology contest. Seventy percent indicated that they would like to allow each team to participate in the area contest more than once. This opinion was reversed for the State contest--65 percent of the teachers would like each team to participate only once in the State contest. Some change in the livestock contest was desired by 50 percent of them, and 27 percent wanted the fat classes slaughtered and cut-out data sent to each school that participated in the contest. Approximately 25 percent of the teachers wanted judging of breeding livestock to be based on type and production. A desire for some change in the land contest was indicated by 47 percent. Most teachers wanted to discontinue the use of abandoned land for judging sites. Not enough teachers desired any changes in the other eight contests included in this study to justify any changes.

3281. COLEBANK, CARL ALLEN. An Evaluation of Future Farmers of America Contests and Awards in West Virginia by High School Principals, Teachers of Vocational Agriculture, and Future Farmers of America Chapter Presidents. Thesis, M.S., 1965, West Virginia University. 81 p. Library, West Virginia University, Morgantown.

Purpose.--(1) To show how high school principals, teachers of vocational agriculture, and FFA chapter presidents felt about having contests and awards; (2) to determine the feasibility and/or limit for using class time to prepare for contests and awards; (3) to find out how those surveyed felt about the number of contests now held; (4) to determine if a West Virginia FFA Foundation is needed; (5) to see if certain contests or awards should be eliminated or revised; and (6) to determine, on the basis of one hundred points, how those surveyed rated certain specific benefits derived from contests and awards.

Method.--Data were collected by means of a questionnaire directed to 93 high school principals, 107 teachers of vocational agriculture, and 91 FFA chapter presidents in West Virginia. Of the questionnaires distributed 183, or 65 percent, were returned.

Findings.--The individuals surveyed were nearly unanimous in their opinion that contests and awards should be a part of the vocational agriculture program. Respondents favored, by a wide margin, using some class time to prepare for contests and awards. Over 50 percent of those surveyed thought that 25 percent of the class time was the right amount to prepare for contests and awards. Teachers were generally of the opinion that there were too many contests and awards in the present West Virginia program. The high school principals and FFA presidents were generally satisfied with the number of contests and awards.

Of the responses 70 percent of them favored the establishment of a West Virginia FFA Foundation patterned after the National FFA Foundation. There was much difference of opinion concerning the amount of class time that should be used to prepare for contests and awards. The concensus was that slightly more non-class time than class time should be used for contest preparation and that more total time was needed to prepare for contests involving teams. Over 60 percent of the teachers favored the elimination of the scrapbook contest. Principals and FFA presidents were generally in favor of omitting this contest from the program. The secretary's book, treasurer's book, talent, and FFA cooperative study were other contests for which it was felt further evaluation was needed.

On the basis of 100 points, the evaluations of the benefits derived from FFA contests and awards were summarized as follows: agricultural knowledge, 26 points; leadership, 18 points; public relations, 13 points; cooperative endeavor, 10 points; citizenship, 10 points; scholarship, 9 points; community service, 8 points; and recreation, 6 points.

3282. COOK, JAMES L. Level of Accounts and Records in Relation to Business and Personal Characteristics of Farmers in Agricultural Education. Thesis, D.Ed., 1965, The Pennsylvania State University. 127 p. Library, The Pennsylvania State University, University Park.

Purpose.--To evaluate three levels of farm account and record-keeping systems when used to provide facts and knowledge that would assist in making decisions, (2) to determine if selected farm account and record-keeping systems could be changed, expanded, or supplemented to include the data necessary for farm business analysis and farm planning, (3) to discover relationships among groups of farmers by level of accounts and records when tested by several measures of the farmer, and (4) to discover relationships among groups of farmers by level of accounts and records when tested by several measures of the farm.

Method.--The study was completed in two phases. During the first phase, all available information from farm accounts and records for three selected farms was used to calculate a partial budget for each enterprise in use on each farm. In addition, a linear programming model was constructed for each farm. Data and information not available from the records were required. The sources of the additional data were recorded and included in the study.

For the second phase, all of the class members of one Young Farmer Association who were responsible for keeping farm accounts and records were divided into three groups on the basis of the record-keeping system which they employed for the year 1964. The groups used high, medium, or low levels of record-keeping. A random sample of 15 farmers was chosen from each group. Each farmer was interviewed individually to obtain the criterion measure data. Six instruments were used during the interviews. The study was designed to determine significant differences and relationships among the groups of farmers. The statistical treatments of analysis of variance, covariance, correlation, and the Tukey Test were used.

Findings.--The results indicated (1) that the high level of farm account and record-keeping system provided significantly more of the input-output data and production functions needed to construct a budget for each enterprise in use on the farm, and (2) that the single entry record-keeping systems used could be expanded, changed, or supplemented to include the data needed to complete a farm business analysis and to construct a partial budget for each enterprise in use on the farm.

When tested by several measures of the farmer and by several measures of the farm, there were differences among groups of farmers using the three levels of farm account and record-keeping systems. In the measures of the farmer scores for leadership experience, farm business involvement, farm management, and education completed were significantly higher for the men in the high-level record-keeping group than for those in the other groups. In the measures of the farm the scores for months of labor, number of cows, milk sold per year, gross farm income, and net farm income were significantly higher for the men in the high-level record-keeping group than for those in the other two groups.

3283. COOPER, ELMER L. Characteristics of High School Pupils Enrolled in Vocational Agriculture Classes in Selected Maryland Schools. Thesis, M.S., 1965, University of Maryland. 83 p. Library, University of Maryland, College Park.

Purpose.--To identify certain abilities, home experiences, interests, and vocational aspirations of boys enrolled in vocational agriculture in Maryland.

Method.--Subjects were 10th, 11th, and 12th grade vocational agriculture pupils in 13 schools located in 12 of Maryland's 23 counties. These vocational agriculture pupils were compared with all 10th and 12th grade pupils in their grades. Data consisted of pupil responses to a survey instrument plus standardized test scores on file in the schools. The chi square test of independence was used to test relationships between selected factors.

Findings.--(1) Most respondents had extensive farm experiences. (2) Two-thirds of the students reported farm residence, and of these students one-third indicated that their fathers were full-time farmers while one-third indicated that their fathers farmed on a part-time basis. (3) The fathers of three-fourths of the respondents were either farmers, craftsmen, or operative workers. (4) Eighty-eight percent of the pupils planned occupations that utilized skills learned in the program. (5) FFA was a very positive factor in pupil recruitment. (6) Standardized test scores indicated significantly lower intelligence level and lower mathematic achievement of pupils enrolled in agriculture as compared with the total male population of their grade. (7) There was a positive relationship between high grades and full-time farm work responsibilities.

3284. CUNNINGHAM, CLARENCE J. Measures of Leader Behavior and Their Relation to Performance Levels of County Extension Agents. Dissertation, Ph.D., 1964, The Ohio State University. 187 p. Library, The Ohio State University, Columbus.

Purpose.--To develop an instrument which would measure the leader behavior dimensions of considering and initiating structures as applied to county extension agents and to determine whether the leader behavior dimensions were sufficiently related to performance for the instrument to be used in the selection and placement of agent personnel.

Method.--The author developed three experimental scales adapted from the Leader Description Questionnaire which were purported to measure leader behavior. The questionnaire which was most valid in measuring leader behavior was completed by 185 county extension agents including agents in agriculture, home economics, and 4-H. The immediate supervisor completed the same questionnaire for each county agent.

The results from the use of the instrument determined four agent classification groups. These groups were then compared for significant differences in personnel performance scores by using analysis of variance.

Findings.--The new instrument was fairly reliable when extension agents were described by supervisors, but it was not reliable when used by agents as a self-description scale.

When the data secured from descriptions by supervisors were used, it was found that the county extension agents who performed most efficiently were those above the median on both dimensions of leader behavior, "initiating structure" and "consideration." The leader behavior theory upon which the study was based was thus supported.

The effective extension agents performed at a high level regardless of the leader behavior of the other agents working with them.

3285. CUNNINGHAM, REX EDWIN. Administration and Objectives of On-The-Job Guidance and Training Programs for Vocational Agriculture Students in Northwestern Ohio. Thesis, M.S., 1964, The Ohio State University. 147 p. Library, The Ohio State University, Columbus.

Purpose.--To establish objectives, determine responsibilities, and make recommendations regarding the organization and administration of on-the-job guidance and training programs in off-farm agricultural industries for students of vocational agriculture.

Method.--Data for the study were secured through a questionnaire sent to high school superintendents, guidance counselors, vocational agriculture teachers, and representatives of off-farm agriculture industries located within the rural areas of 16 counties in northwestern Ohio.

Findings.--Objectives for such programs should provide practical application of classroom instruction, assist the student in selecting an occupation, expose students to several occupations, have the student work under supervision, and develop their ability to work with other people. Eighty-eight percent of off-farm agricultural industries were willing to cooperate. Results of this study indicate that only juniors and seniors selected by the guidance counselor and vocational agriculture teacher should be enrolled, that students should work from 41-120 days as a part of the school day and for three to four hours per day, and that they should be compensated at a rate of $.75 to $1.00 per hour.

3286. CUSHMAN, HAROLD R., CHRISTENSEN, VIRGIL E., and BICE, GARRY R.

A Study of Off-Farm Agricultural Occupations in New York State.

Staff Study, 1965, Cornell University. 95 p. Agricultural

Education Division, Cornell University, Ithaca.

Purpose.--(1) What are the off-farm agricultural occupations? (2) What proportion of time is devoted to use of agricultural competencies in off-farm agricultural occupations? (3) How many persons are employed in such occupations? (4) At what levels of employment are such occupations found? (5) What is the outlook for employment opportunities in these jobs? (6) What agricultural competencies are needed by workers in off-farm agricultural occupations?

Method.--The 260 school districts in New York State offering instruction in agriculture during the school year 1963-64 were selected as the study population. From these 260 districts a stratified random sample of 16 was selected. Farming area, K-12 school population, and "full value of taxable real property per resident child in weighted average daily attendance" were the bases for stratification. An additional sample of two school districts was selected in the Adirondack area. Interview schedules and an interviewer's manual were developed, field-tested, and revised. Representatives of 541 businesses and services were interviewed in these 16 school districts. An additional 53 businesses and services were studied in the Adirondack area.

Findings.--In the 16 school districts 213 different job titles were identified. Employers reported that workers in off-farm agricultural occupations used agricultural competencies 83 percent of the time on the job. It was estimated that 28,685 full-time workers and 16,841 part-time workers were employed in off-farm agricultural occupations in the 260 school districts. On a per school district basis, it was estimated that there were 110 full-time and 65 part-time persons so employed. Part-time workers were most often found in semi-skilled positions. Employers estimated a growth in off-farm agricultural occupations between 1964 and 1969 of 19 percent for full-time workers and of 13 percent for part-time workers. It appeared that training programs should emphasize competencies in: (1) agricultural business and agricultural mechanics for prospective workers in all occupational families, (2) plant science for prospective workers in Crops Marketing and Processing, Forestry and Soil Conservation, Wildlife and Recreation, Ornamental Horticulture, and Agricultural Service occupations, (3) Animal Science for prospective workers in Dairy Manufacturing and Processing, Livestock Marketing and Processing, Other Livestock Industry and Farm Service occupations, and (4) Forestry, Conservation, and Outdoor Recreation for prospective workers in these fields.

3287. CUSHMAN, HAROLD R. and JARMIN, MARTIN V. The Organization and Utilization of Agricultural Advisory Boards in New York State. Staff Study, 1965, Cornell University. 118 p. Agricultural Education Division, Cornell University, Ithaca.

Purpose.--(1) To determine the characteristics of agricultural advisory boards in New York State, (2) to discover what trends are taking place in the organization and utilization of agricultural advisory boards in New York State, and (3) to ascertain how "effective" and "ineffective" agricultural advisory boards differ in membership, appointment of members, manner in which they function, and activities engaged in.

Method.--The 258 school districts in New York State offering instruction in agriculture during the school year 1960-61 were selected as the study population. A pre-coded questionnaire was constructed, field-tested, revised, and mailed in 1961 to teachers who had taught agriculture in New York secondary schools during 1960. The practices and characteristics of boards were grouped, tabulated, and transferred to I.B.M. cards. Trends were discovered by comparing characteristics cited by Coombs in 1945-46 with 1960-61 data. Boards rated effective and ineffective were separated. To measure the difference between the effective and ineffective boards in practices or characteristics, a difference in proportion test, chi square, or a median test were employed where appropriate.

Findings.--Eighteen trends were cited in the organization and utilization of agricultural advisory boards in New York State. A comparison of 100 effective and 99 ineffective agricultural advisory boards confirmed the implication drawn from the review of previous research that effective boards could be expected to differ from ineffective boards in the following ways: (1) Effective boards had a significantly larger number of appointed members, a significantly greater number of meetings, and a higher attendance of members. (2) A significantly greater proportion of the effective boards: (a) participate in the nomination of appointed members; (b) notify new members of their appointment by letter from the board of education; (c) arrive at recommendations in group meetings, schedule dates of future meetings at their first meeting, schedule meetings at equal intervals throughout the year, plan a program of work, prepare an agenda for meetings, and use rules of parliamentary procedure; (d) study and make recommendations about vocational agriculture programs concerning course of study content, course sequence, physical facilities, need for young and adult farmer programs, evaluation of programs, summer program of work, locating farms for work experience, public relations, FFA, annual program of work, and standards for farming programs; and (e) make a policy of meeting with a new teacher soon after his arrival in the community for the purpose of orienting him.

A significantly greater proportion of teachers who had effective agricultural advisory boards cited as advantages of such boards factors relating to the improvement of public relations and improvement of teacher efficiency and effectiveness.

3288. CVANCARA, JOSEPH GEORGE. Input-Output Relationships Among Selected Intellectual Investments in Agriculture. Thesis, Ph.D., 1964, University of Minnesota. 113 p. Library, University of Minnesota, St. Paul.

Purpose.--(1) To determine the direction and degree to which production units in agriculture respond to educational investment and to identify whether instruction in farm management influences various farm measures (returns) and thereby affects farm income, and (2) to study the cumulative or diminishing effects on increases in cash income which may be caused by farm management instruction when matched farm units are compared after one, two, or three years.

Method.--Data were collected on two groups of Minnesota farm units representing 20 communities. Group "A" participated in the Minnesota farm management program during the years 1960, 1961, and 1962. Group "B" did not receive this instruction in 1962. Groups "A" and "B" were paired on the basis of the 1962 records according to size measured in work units and on the combination of livestock and crop enterprises. Farm units were selected within areas where soil, climate, and topographical factors were similar in nature.

Cash income was the criterion variable used to evaluate the effect of several different predictive variables. The tests of significance included the t-test, the F-ratio as developed through variance analysis, and multiple correlation and regression techniques.

Microeconomic investigations were made on the input costs of farm management instruction on each of the 66 farm units. Further analyses were made to measure whether the increases in farm output for those farmers enrolled in management exceeded the community input costs for conducting a farm management program.

Findings.--The study showed (1) that farmers in Group "A" had over $500.00 higher average farm incomes than farmers in Group "B," (2) that Group "B" farms had the potential of increasing farm income, (3) that improvement in farm income was subject to the diminishing return effect, and (4) that there was an increase in income from year to year with the greatest increase occurring during the second year of the experimental 3-year period with a higher average rate of increase for those farmers participating in a farm management program.

3289. DAUGHERTY, R. GENE. The Development and Evaluation of a Unit of Instruction on Beef Marketing. Thesis, M.Ed., 1965, The Pennsylvania State University. 121 p. Department of Agricultural Education, The Pennsylvania State University, University Park.

Purpose.--(1) To develop a teacher's unit plan on beef marketing, (2) to develop a student resource handbook on beef marketing, (3) to measure the knowledge gained and the adoption of selected practices in a course on beef marketing taught to young farmers in five Lancaster County high schools, and (4) to compare selected factors dealing with the personal, professional, and educational qualifications of young farmers who enrolled for and completed a marketing course with their subsequent scores on a multiple-choice achievement test on beef marketing.

Method.--A teacher's unit plan and a student's resource handbook of subject-matter on beef marketing were developed. The plan and the handbook were field-tested in five Lancaster County high schools. Sixty-four young farmers enrolled for and completed an 18-hour course on beef marketing during a 5-week period. Tests were given and a checklist of beef marketing practices was completed at the beginning and at the end of the course.

Findings.--The unit of instruction on beef marketing, the teacher's unit plan, and the student resource handbook were effective tools in teaching beef marketing to young farmers in Lancaster County as measured by the achievement test and by the number of marketing practices adopted.

Sixty-four young farmers in five different schools scored significantly higher, at the .01 level, on a multiple-choice achievement test which followed a pre-test and six weeks of beef marketing instruction. Pre-test and test scores were compared by t-test. The number of farmers using recommended marketing practices at the end of the course was consistently higher for each marketing practice than the number using the same practices at the beginning of the course.

Negative coefficients of correlation, significant at the .01 level, were found between age and number of market news publications read (-0.376) and between years of beef marketing experience and the number of market news publications read (-0.334). Positive coefficients of correlation, significant at the .01 level, were found between pre-test scores and the number of market news publications read (0.332), between pre-test scores and the number of classes attended (0.326), and between pre-test scores and test scores (0.692).

3290. DAYGER, WILLIS G. The Effectiveness of the Programed Instructional Unit Figuring Board Feet for Teaching Vocational Agriculture Students in New York State. Thesis, M.Ed., 1965, Cornell University. 149 p. Library, Cornell University, Ithaca.

Purpose.--The primary purpose of this study was to determine the educational effectiveness of the programed instructional unit on Figuring Board Feet as compared with the conventional teaching method. A secondary purpose was to determine the attitude of students toward using programed instruction for learning.

Method.--A linear-type programed unit of instruction on figuring board feet was developed. A criterion examination and a student attitude survey form were developed.

Data were collected in 24 schools from 101 students in the experimental group and from 156 students in the control group. Teachers in the experimental group administered the programed materials to their students while teachers in the control group were instructed to teach the unit in the conventional manner.

Findings.--Based on the increase in mean scores between the pre-test and the post-test, the programed unit on Figuring Board Feet was an effective unit of instruction. The programed unit was as effective as the control method. The programed unit was more efficient in the use of classroom time than the control method. A majority of the students had a favorable attitude toward programed instruction and felt that it should be used more frequently.

3291. DEMICK, DONALD G. Improving the Agricultural Engineering Technology Curriculum at the Agricultural and Technical Institute, Cobleskill, New York. Thesis, M.Ed., 1964, Cornell University. 84 p. Library, Cornell University, Ithaca.

Purpose.--(1) To compare the curriculum in agricultural engineering at Cobleskill with that of the other agricultural and technical institutes in New York State, (2) to discover the placement of students who majored in Agricultural Engineering Technology, (3) to discover employee competencies believed to be important by prospective employers, and (4) to make recommendations for strengthening the Agricultural Engineering Technology curriculum at Cobleskill.

Method.--Courses in the Agricultural Engineering Technology curriculum at Cobleskill were compared with the course in the same or related technology curricula in other agricultural and technical institutes. Catalog descriptions of courses were used and all credit hours adjusted to a semester basis.

Placement records of Agricultural Engineering Technology majors for the years between 1959 and 1963, taken at the time of graduation, were compiled. A panel of consultants was used to help develop a questionnaire to survey the members of the New York Farm Equipment Dealer's Association and personnel from all companies who maintained branch houses in New York State. The questionnaire was designed to determine the knowledge and abilities needed in the farm and power equipment field, at both the company and the dealer level. Replies were received from 100 companies and dealers.

Findings.--The curricula at Alfred, Cobleskill, and Morrisville had the same general make-up and credit hours. The curriculum at Canton was general agriculture; at Delhi, an engineering-level program; and at Farmingdale, mechanical power technology. Other colleges did not have curricula in Agricultural Engineering Technology.

Placement records indicated that 75.5 percent of the trainees obtained employment in the field of training including the fields of service, parts, sales, materials handling, light industrial equipment, and farming. From the 105 items in 10 categories of knowledge and abilities needed, it was determined that the training of service and parts personnel tended to follow each other closely. The training for salesmen and owners or managers followed the same pattern. There were some differences in training emphasis at the company and dealer levels. A farm background was not considered necessary for success in the field but was considered desirable. Less emphasis was placed on this characteristic at the company level. Minimum educational level, from the company viewpoint, was two years or more of college. Less importance was placed on this factor in the dealerships.

The curriculum at Cobleskill might be improved by: (1) strengthening in mathematics; (2) expanding the curriculum to include courses in light industrial equipment, refrigeration, metallurgy, and lawn and garden equipment; and (3) revising the course content and expanding the curriculum to include two specialization options--one in service and parts and the other in sales and management.

3292. DETTMANN, EMERON PAUL. Competencies in Agricultural Mechanics Needed by Vocational Agriculture Instructors. Thesis, M.S., 1965, Iowa State University of Science and Technology. 106 p. Library, Iowa State University of Science and Technology, Ames.

Purpose.--To determine the competencies in agricultural mechanics needed by vocational agriculture instructors, the degree of competence possessed by the instructors, and the place where competencies were acquired.

Method.--A list of competencies was developed by a panel of outstanding vocational agriculture instructors and revised by a panel of the College of Agriculture specialists. The revised list was mailed in questionnaire form to 225 experienced Iowa vocational agriculture instructors. Instructors indicated on a 10 point scale the degree to which each of the 56 competencies was needed and possessed and whether the competence was acquired on a farm, in a vocational agriculture course in high school, in a college course, or on the job. Instructors were stratified into Groups A, B, C, or D according to teaching competency.

Findings.--Competencies involving safety factors and the correct use of all tools were given high-degree-of-competency-needed scores by both Groups "A" and "D." Other high-ranking competencies needed were: figuring a bill of materials, constructing and repairing buildings and equipment, selecting electrodes, and operating farm tractors and machinery--including maintenance and adjustment. Ranked lowest by Group "A" instructors on the basis of need, in descending order of importance, were: installing copper tubing, flaring and soldering joints, selecting and caring for rope, and doing forge work.

The Spearman rank order coefficient of correlation was used to analyze both the mean-competency-needed and the mean-competency-possessed scores for Groups "A" and "D." A correlation of 0.87 was obtained for competency-needed scores, while competency-possessed scores yielded a correlation of 0.90. The most important source of acquiring competencies was college, while on the job ranked second.

3293. DILLON, ROY DEAN. Comparison of Certain Abilities Needed by Workers in Licensed Nurseries and Licensed Ornamental Horticulture Businesses. Thesis, Ed.D., 1965, The University of Illinois. 255 p. Library, The University of Illinois, Urbana.

Purpose.--The major purpose of the study was to determine whether separate and specialized agriculture courses are needed for workers in nurseries and ornamental horticulture businesses. An additional purpose was to determine the content of these courses.

Method.--The study involved three major tasks: (1) developing a questionnaire containing one hundred items of knowledge in agriculture in the four areas of horticulture, agricultural chemicals, floriculture, and soils; (2) interviewing head workers in the four job titles of general director, salesman, supervisor, and field worker from a random sample of 20 licensed grower nurseries and from a random sample of 20 licensed horticulture retail and landscaping businesses in northeastern Illinois; and (3) analyzing statistical data for each of three major hypotheses. Statistical techniques used were the "z" test and analysis of variance.

Findings.--In testing the first major hypothesis which pertained to whether significant differences existed in the kinds of knowledge needed by workers with comparable job titles in licensed nurseries and in licensed ornamental horticulture businesses, the "z" test indicated significant differences for (1) ten of the one hundred items of knowledge for general directors; (2) twelve of the one hundred items of knowledge for salesmen; (3) two of the one hundred items of knowledge for supervisors; and (4) four of the one hundred items for field workers. The number of items of knowledge needed by general directors, salesmen, supervisors, and field workers ranged from two to eighty-four according to the job title and the type of horticulture business.

The second major hypothesis was concerned with whether significant differences existed among the means of groups of items of knowledge across the four job titles studied in licensed nurseries. The F test revealed a significant difference for seventeen of the nineteen groups of items of knowledge studied.

The third major hypothesis investigated whether significant differences existed among the means of groups of items of knowledge across the four job titles studied in licensed ornamental horticulture businesses. The F test revealed significant differences for all of the nineteen groups of items studied. For both the second and third hypotheses, it was concluded that differences in the level of ability needed by general directors, salesmen, supervisors, and field workers probably represented differences due to the way the workers used their agricultural knowledge in their jobs.

The content for a total of thirteen basic courses or units was recommended for persons preparing to enter horticultural jobs. The content for a total of ten specialized courses or units was recommended for persons in one, two, or three job titles studied.

3294. DUNIGAN, ROBERT LEWIS. Adoption of Recommended Practices in the Production of Sweet Potatoes. Thesis, M.Ed., 1963, North Carolina State University. 68 p. Library, North Carolina State University, Raleigh.

Purpose.--To associate seven farm indices with the adoption of recommended practices in growing sweet potatoes. A secondary purpose of the study was to locate factors that seemed to limit the production of sweet potatoes in Meadow School Community. The study was also made to provide the teacher of agriculture with information that could lead to a more efficient program of vocational agriculture.

Method.--A preliminary house-to-house survey was conducted by students studying vocational agriculture to determine the location and number of farmers who grew sweet potatoes commercially during the last growing season. An interview schedule was prepared which included seven farm indices. They were: (1) age of operator, (2) education, (3) tenure, (4) size of farm, (5) production of sweet potatoes commercially, (6) level of communications, and (7) level of living. Included in the schedule was a check list of: (1) 16 recommended practices for the production of sweet potatoes, (2) 11 recommended practices for the production of sweet potato plants, and (3) 11 recommended practices for growers who bought sweet potato plants. All 159 interviews were made by 29 students enrolled in vocational agriculture and the teacher of agriculture.

Findings.--The seven farm indices as associated with the adoption of recommended practices in field production of sweet potatoes produced the following information: (1) Size of enterprise, years of producing, level of living, and level of communication were highly associated with the use of recommended practices. (2) Age, education, tenure, and size of farm were moderately associated with the use of recommended practices.

The seven indices in relation to the production of sweet potato plants resulted in the following: (1) Age, tenure, size of farm, and level of living were highly associated with the use of recommended practices. (2) Size of enterprise and years of producing were moderately associated with the use of recommended practices.

The seven indices were used in ascertaining relationship to the purchase of sweet potato plants: (1) Age, size of farm, level of living, and level of communication were highly associated with the use of recommended practices. (2) Education and tenure were moderately associated with these practices. (3) Size of enterprise and years producing were not significantly associated with use of recommended practices.

There were 38 recommended practices included in the study; 12 practices indicated a need for further instruction for about half of the 159 growers.

3295. EBBERT, J. MARVIN. The Development of a Standardized Achievement Test for Small Gasoline Engine Instruction. Dissertation, Ph.D., 1964, Purdue University. 161 p. Library, Purdue University, Lafayette.

Purpose.--To develop a standardized, multiple-choice achievement test covering the fundamentals of operation, care, and maintenance of small gasoline engines.

Method.--Seventy-five vocational agriculture teachers in Indiana high schools indicated an interest in cooperating in the test development project. Following the development of a list of operational objectives, a unit outline was developed. The objectives and outline, along with a suggested time allotment for accomplishing the objectives and teaching the indicated content, was submitted to a panel. Following approval and modification of the objectives and outline, test items were written, modified, and approved. Items were written in accordance with a table of specifications.

Since a final suggested form that could be administered in one 50-minute school period was desired, a preliminary form of 175 items that could be administered in two 50-minute periods was designed. Following the administration of the test in 68 schools, the results were item analyzed. A refinement process was accomplished whereby 100 items were selected which met the 5 percent level of significance in both the item analysis sample and a sample reserved for cross validation purposes.

Findings.--The suggested final form was presented with norms based on a combined group of 565 Indiana sophomore and junior vocational agriculture students and 337 Indiana senior vocational agriculture students.

The test will serve as a basis for studies in farm mechanics with emphasis on such problems as: (1) the proper balance between laboratory and classroom instruction, (2) the influence of instruction that is project-centered versus that which is not, and (3) the effectiveness of various methods of teaching and teaching materials in the small engines area.

3296. EGGENBERGER, ULRICH LEWIS. An Analysis of High School Vocational Agriculture from Evaluations of Graduates in West Texas. Dissertation, Ph.D., 1964, Iowa State University of Science and Technology. 166 p. Library, Iowa State University of Science and Technology, Ames.

Purpose.--(1) To determine the present occupational status of West Texas high school graduates of 1953, 1954, and 1955 who had completed one or more years of vocational agriculture. (2) To determine factors related to the occupational choices of graduates. (3) To evaluate the high school course areas and the vocational agriculture programs as related to the occupations of graduates. (4) To determine possible changes that could be made in vocational agriculture in order to meet the needs of male high school graduates.

Method.--Questionnaires were mailed to the graduates of 45 West Texas high schools. Questionnaires were received from 846 graduates representing 70.4 percent of the total.

Findings.--Of the graduates 28.4 percent or 240 were farm operators, 15.7 percent or 133 were employed in farm-related occupations, and 6.4 percent or 54 were in the military service.

The following factors were related to the occupational choices of the graduates at the one percent level of significance when tested by chi square: occupation of the father, acres of land operated by the father while the son was in high school, years of vocational agriculture completed by the high school graduate, and the graduate's subsequent attendance at college. The scholastic rank of the high school graduate was significant at the five percent level.

Approximately three-fifths of the 846 graduates had attended college. One-half of those who had attended college had received a degree.

The graduates rated the value of the high school course areas in the following descending order of importance: mathematics, English, business and bookkeeping, speech, vocational agriculture, science, industrial arts, typing, and foreign language. Farm operators rated vocational agriculture second and those graduates in farm-related occupations rated it fourth.

Farm operators rated the value of the eight subject-matter units in vocational agriculture in the following descending order of importance: crop production, farm management, farm mechanics, livestock production, soils, agricultural occupations, FFA leadership activities, and horticulture. Graduates in farm-related occupations rated soils and FFA leadership activities higher than did the farm operators.

The supervised farming program was rated "important" to the farm operators and to those in farm-related occupations but of "little importance" to those in non-agricultural occupations.

Graduates who were in farm-related occupations or were farm operators received the most value from their FFA training, indicating its value as "important." Graduates in the three occupation groups who participated in FFA Leadership contests rated the training as "important" on their present occupation.

Graduates who were farm operators and who were in farm-related occupations rated the value of agricultural judging contests considerably higher than did those graduates in non-agricultural occupations. Graduates who were farm operators had greater participation and received more value from training received in fitting and showing livestock than did the other groups.

3297. EZELL, DANNY O. and SIMPSON, DREWRY N. Educational Needs of Peach Orchard Owners, Foremen, and Employees in Spartanburg County, South Carolina. Staff Study, 1964, Clemson University. 32 p. Department of Agricultural Education, Clemson University, Clemson.

Purpose.--To determine the kind of training needs that might be provided by vocational agriculture departments to keep peach orchard owners, foremen, and workers up-to-date.

Method.--Peach orchard owners selected by random sampling techniques were interviewed. These owners consisted of two groups, those with less than 25 acres of peach trees and those with more than 25 acres of peach trees.

Findings.--Of the large producers 40 to 90 percent indicated that they needed training in various plant science subjects. They also suggested that workers and foremen needed such training, but to a lesser degree. According to this group, workers and owners were particularly in need of training in agricultural mechanics. Carpentry was an exception with only a 20 percent response interest indicated. Over 50 percent of these owners felt training would be beneficial in the specific areas of soils. The response for owners and workers was somewhat less. Over 50 percent of the owners felt a need for training in agricultural economics but did not feel such training was essential for workers or foremen. Less than 50 percent of the owners expressed a need for special training in basic subject matter areas such as algebra and mathematics. There was some expression of interest in other types of fruit.

The small producers were less enthusiastic about training, although the owners expressed need for training in about the same areas as the large producers. Most of the small producers expressed very little need of special training for workers. Since none of these owners employed a foreman, the needs of foremen were omitted from the study of small producers.

3298. FISCUS, KEITH EUGENE. A Comparison of Certain Knowledges in Agriculture Needed by Workers in Farming, in Grain Elevator Businesses, and in Agricultural Equipment Businesses. Thesis, Ed.D., 1965, University of Illinois. 330 p. Library, University of Illinois, Urbana.

Purpose.--To determine the vocational and technical education in agriculture needed for prospective workers in farming, in grain elevator businesses, and in agricultural equipment businesses.

Method.--A questionnaire was developed to determine the knowledge of agriculture that is needed. The questionnaire items were categorized into the following knowledge areas: (1) livestock, (2) crops, (3) soil fertility and management, (4) agricultural resource conservation, (5) agricultural mechanics, (6) agricultural power and equipment, and (7) agricultural business management.

In each of the jobs of (1) farm manager, (2) grain elevator manager, (3) grain elevator operator, (4) grain elevator salesman, (5) grain elevator deliveryman, (6) agricultural equipment manager, (7) agricultural equipment mechanic, (8) agricultural equipment salesman, and (9) agricultural equipment set-up man 20 employees were interviewed by the investigator. Businesses were randomly selected from the fields of farming, grain elevator, and agricultural equipment in a fourteen county area of east-central Illinois.

A quasi-split-plot design analysis of variance test was used to determine whether or not there were significant differences between the mean scores for workers in the primary jobs and between the mean scores for the agricultural knowledge areas. Duncan's Multiple Range Test and the t-test were used to identify (1) the groups of workers with significant mean scores, and (2) the significant agricultural knowledge areas and the significant items of knowledge needed by workers employed in nine job categories in three agricultural businesses.

Findings.--(1) Workers in each of the four primary jobs in grain elevator businesses needed differentiated knowledges in the seven agricultural knowledge areas. (2) Workers in each of the four primary jobs in agricultural equipment businesses needed differentiated knowledges in the seven agricultural knowledge areas. (3) Workers in comparable jobs, regardless of the kind of agricultural business in which they were employed, needed differentiated knowledges in the seven agricultural knowledge areas. (4) Workers in farming, in grain elevator businesses, and in agricultural equipment businesses each needed differentiated knowledges in the seven agricultural knowledge areas. (5) Workers in grain elevator businesses needed different knowledges than the workers in the agricultural equipment businesses in the seven agricultural knowledge areas.

Thirty-eight instructional units were recommended for prospective workers in farming, grain elevator and agricultural equipment for nine job categories. Fifteen of the thirty-eight instructional units were basic units recommended for high school, twenty were advanced units and three were specialized units recommended for post-high school and the continuing education levels. It was recommended that workers in seven of the nine agricultural job categories needed post-high school and continuing education in agriculture.

3299. GARDNER, HARRISON. Determining Competencies for Initial Employment in the Dairy Farm Equipment Business. Thesis, Ph.D., 1964, Michigan State University. 238 p. Library, Michigan State University, East Lansing.

Purpose.--To demonstrate a method of identifying certain competencies and related information essential to the success of persons who seek employment in non-farm occupations that provide the farmer with direct-contact services.

Method.--The method utilized to gather occupational information and translate the information into vocational programs was developed in the perspective of a larger, more inclusive framework. Data were secured relevant to one phase of the non-farm agricultural industry, the dairy farm equipment business. From a review of occupational literature, a list of 129 worker competencies was prepared in the form of a questionnaire, to obtain information considered important for the preparation of workers who, during initial employment, sell, install, or maintain bulk tanks or milking systems.

The questionnaire was completed by a panel of 11 persons considered to be authorities in the dairy industry and a group of 88 Michigan teachers of vocational agriculture. The panel members indicated the value and importance of each competency for entrance workers. The teachers indicated which of the competencies had been taught in all-day, young farmer, or adult farmer classes during the previous year.

Findings.--Responses of panel members indicated that the method demonstrated in the study was effective in obtaining important information for workers who seek employment in certain non-farm agricultural occupations. These occupations provide the farmer with direct-contact services through the sale, installation, and maintenance of bulk tanks or milking systems. The method as demonstrated was effective in providing information that can be used as a basis for developing training programs.

The responses of the panel members provided consistent clusters of competencies around which educational programs may be organized. Clusters of competencies were identified in the areas of farming, human relations, salesmanship, and mechanics that were important for employees who during initial employment sell, install, or maintain bulk milk tanks or milking systems.

Nearly three-fourths of the 129 competencies were rated as having considerable value for the workers by over 60 percent of the panel members who indicated that: (1) slightly over one-half of the competencies were important during initial employment for workers who only sell or who both sell and maintain the prescribed dairy equipment; and (2) slightly less than one-fourth of the competencies were important for workers who install, or maintain, or who both install and maintain equipment.

Responses of teachers indicated that few of the competencies identified by the panel members as needed by those workers were being taught as a part of local programs of vocational agriculture in Michigan.

3300. GEORGE, WILLIAM C. A Study of Farm Mechanics Jobs Taught by Teachers of Vocational Agriculture in Missouri. Dissertation, Ed.D., 1964, University of Missouri. 252 p. Library, University of Missouri, Columbia.

Purpose.--To determine what farm mechanics jobs were being taught in the day classes of Missouri high schools with departments of vocational agriculture.

Method.--Data relating to the programs of vocational agriculture were obtained by means of an information form sent to 254 teachers of vocational agriculture for the school year 1962-63. The form was based on the list of farm mechanics jobs as issued by the State Department of Education, Jefferson City, Missouri. There were 16 subject matter areas with 73 farm mechanics jobs listed on the form.

Findings.--Forms were returned by 175 of the 254 teachers. The mean number of periods reported by teachers for their present teaching programs for 16 subject matter areas were: 29.4 for farm engines and tractors, 21.8 for woodworking, 17.4 for farm machinery, 17.4 for electric arc welding, 14.3 for farm electricity, 10.6 for oxy-acetylene welding, 9.2 for cold metal work, 8.9 for forge work, 6.5 for farm plumbing, 5.8 for farm structures, 4.6 for the farm service center, 4.6 for farm painting, and 3.4 for fencing. The mean number of periods suggested by the teachers included 35.1 for farm engines and tractors, 24.0 for woodworking, 20.7 for farm machinery, 18.8 for electric welding, 16.0 for electricity, 12.3 for oxy-acetylene welding, 10.8 for concrete and masonry, 10.6 for tool sharpening, 10.1 for cold metal work, 8.7 for farm plumbing, 1.7 for farm structures, 7.0 for forge work, 5.3 for the farm service center, 4.9 for farm painting, 4.8 for soldering, and 4.1 periods for farm fencing.

The teachers indicated a number of reasons for changing their programs. In 10 of the 73 jobs anywhere from 20 to 33 teachers indicated a need for further training, while 10 to 19 teachers indicated such need in 30 of the 73 jobs. Twenty to 44 teachers indicated a lack of facilities as a reason for not teaching 13 of the 73 jobs, while 10 to 19 teachers indicated this reason for not teaching 22 of the 73 jobs. Twelve to 27 teachers indicated no need in the community for not teaching 6 of the 73 jobs. Twenty to 43 teachers indicated a lack of time as a reason for not teaching 35 of the 73 jobs, while 10 to 20 teachers indicated this reason for not teaching 26 of the 73 jobs.

3301. GOEMMER, CHARLES RAYMOND. A Comparative Study of Teacher Programs of Work for the School Years 1954-55 and 1964-65 in Selected Vocational Agriculture Departments in Washington State. Thesis, M.S., 1965, Washington State University. 90 p. Holland Library, Washington State University, Pullman.

Purpose.--To secure information on how vocational agriculture instructors in 12 high schools in Washington State used their professional time in the school year 1964-65 and to compare the present use of time with that of an earlier survey for 1954-55 in the same schools.

Method.--The teachers of 12 schools were asked to cooperate in this study. A single page report form for each month was developed which allowed entry for each area of work for each day. The areas of teacher responsibility included day school, adult school, supervision of projects, community service, Future Farmers of America, professional improvement, promotion of program, and organization and improvement of equipment.

Findings.--There was a decrease in the hours of professional time devoted to vocational agriculture in the school year 1964-65 compared to 1954-55. In 1964-65 teachers devoted 48 hours per week to professional duties--nearly three hours per week less than reported in the earlier study. Over 93 percent of each teacher's time was spent in day school, FFA, professional improvement activities, and supervising projects. The first three of these showed an increase over the 1954-55 period. There was a decrease in the percentage of time devoted to supervised farming by the present group of teachers as compared with the earlier group. In some cases one-third to one-half of the teacher's time was devoted to Future Farmers of America activities.

3302. GRIFFIN, WARREN L. The Nature of Agricultural Occupations, Other Than Farming, in Saline County, Missouri. Dissertation, Ed.D., 1964, University of Missouri. 364 p. Library, University of Missouri, Columbia.

Purpose.--To determine the present and emerging agricultural occupations other than farming found in Saline County, Missouri, and the competencies and prerequisites needed by an individual to enter and advance in the occupations.

Method.--Data relating to the follow-up of 450 former students of vocational agriculture were obtained primarily from school records and personnel. Data concerning agricultural occupations other than farming were obtained from interviews with 112 owners, managers, or other office personnel of businesses dealing with agricultural products and/or services.

Findings.--At the time of the study there were 112 agencies and firms in operation. They employ 2,006 persons, of whom 615 or 30.6 percent needed a knowledge of agriculture to perform their jobs. There were 28 firms which dealt in plant products or services; 18 in farm equipment and repair; 17 in food processing; 16 in animal products and services; 12 in feed, seed, and fertilizer; 11 in lumber; 9 in education and government; and 5 in farm managerial services.

Of the 615 workers who were employed in agricultural jobs, there were 274 or 44.5 percent in semi-skilled jobs, 92 or 14.9 percent in skilled jobs, 4 or 0.6 percent in clerical jobs, 76 or 12.3 percent in sales, 38 or 6.1 percent serving as supervisors or foremen, 85 or 13.8 percent serving as proprietors or managers, 17 or 2.7 percent serving as technicians, and 29 or 4.7 percent in professional agricultural jobs.

The activities and duties of employees varied greatly in the different occupations. In most cases, the fewer the number of employees in a firm, the more varied the activities and duties. Likewise, the larger the firm and the greater the number of employees, the more specific were the activities and duties. The technical knowledge required of employees to enter and to advance in agricultural occupations other than farming varies greatly with the particular occupation and the phase of agriculture involved. Eighty different occupations were found in which an agricultural background and/or training was required.

3303. GRIMES, ROBERT HARRISON. A Comparison of Courses Taken and Taught by Teachers of Vocational Agriculture. Thesis, M.S.,

1965, West Virginia University. 83 p. Library, West
Virginia University, Morgantown.

Purpose.--To evaluate vocational agriculture curriculums, related subject matter courses taken by teachers, and the direct effect (if any) of taking a large number of courses in any subject matter area upon the amount of time spent teaching in that area.

Method.--Eighty-seven West Virginia vocational agriculture teachers, representing 80 percent of the total number in the State, were included in the study. Time planned for teaching in eighteen areas of vocational agriculture was taken from courses of instruction of the vocational agriculture departments. Number of credit hours earned in related college courses was taken from the official university records of each teacher. The hours planned to be taught in high school and related credit hours earned in college were tabulated by subject matter areas. Correlations were computed for hours taught in high school and credit hours earned in college to determine the relationship that existed.

Findings.--A correlation of .42, significant at the .01 level, was found between the number of hours taught per subject matter area and the number of credit hours earned in related college courses per teacher. Mean hours taught per department per subject matter area was 38.4. Mean number of credit hours earned in related college courses per teacher was 4.1. With the exception of tobacco, which was only taught in a few departments, the correlations of high school hours and related college credit hours for the individual subject matter areas were very low. These correlations ranged from -.094 to .124.

There was a wide variation in the number of credits vocational agriculture teachers had acquired in specific subject matter areas. The time spent teaching in any subject matter area was apparently determined more by the teacher's analysis of the needs of the students than by the amount of training the teacher had had in that particular subject matter area. Within any subject matter area of vocational agriculture, there was little relationship between the number of credits a teacher had earned in the area and the time spent teaching in that same area. There is a relationship, however, in that the teachers were teaching the subjects they had been taught.

It was further concluded that the best preparation a teacher can obtain to meet all situations in teaching vocational agriculture is as wide a course of training as possible with emphasis on the more important agricultural enterprises in the State.

3304. HAGEN, VERNON A. Employment Opportunities and Needed Competencies in Agriculturally Related Occupations. Thesis, M.S., 1964, Washington State University. 63 p. Holland Library, Washington State University, Pullman.

Purpose.--To determine the competency requirements and employment opportunities for employees engaged in agricultural enterprises other than farming in southwest Washington.

Method.--Data were obtained by personal interview and by questionnaires mailed to 103 employers in agriculturally-related businesses. Ninety-three percent of the businesses responded.

Findings.--Employers preferred to hire persons with a good background in English, speech, salesmanship, mathematics, and specialized study in the area of vocational agriculture related to their particular agri-business. An aggressive leader who can follow orders, accept responsibility, and get along well with people possesses the personal traits employers desired. Salaries ranged from $160 to $1000 per month. Thirty-six percent of the firms indicated a need for increasing employment during the next five years.

3305. HALTERMAN, JERRY JACK. Determination of the Educational Needs of Agricultural Engineering Technicians in Ohio. Dissertation, Ph.D., 1964, The Ohio State University. 300 p. Library, The Ohio State University, Columbus.

Purpose.--(1) To determine the important characteristics and attributes of the agricultural engineering manpower force of the State, (2) to determine the kinds of activities technicians engage in on the job and the technical competencies essential for satisfactory job performance, (3) to develop suggested curriculums for use in the preparation of agricultural engineering technicians, and (4) to comprehensively review the literature pertinent to technical workers and technical education.

Method.--Two questionnaires were used on a state-wide basis to obtain data from technical workers, employers, and jury members. The educational needs of technicians were determined from an analysis of responses which indicated the extent technicians engage in various activities and the importance selected general, technical, and agricultural education subject matter areas were to the satisfactory qualification of technicians.

Findings.--Technical occupations ranging from those of narrow scope and limited level to those of broad scope and high level were found in the field of agricultural engineering. Approximately 40 percent of the tractor and farm machinery dealers had technicians in their employ, and over one-half of the technical workers in the field spent a predominate part of their time in the area of agricultural power and machinery.

Technical workers in the major areas of agricultural engineering and mechanics regularly engaged in groups of activities which had to do with leadership and giving direction, making verbal or written accounts, and offering advice and expertness to others. General education subject matter areas important to these technicians included communication skills (English composition, speech, and reading); elementary mechanics; technical drawing; personnel management; electricity, magnetism and electronics (basic theory); and psychology. Special education subject matter areas considered important were basic agricultural mechanics, safety, materials-handling, and occupational experience. The availability of additional qualified workers and the adequate education of present employees constitutes the major problems of employers.

Technical education characteristically was 2-year post-high school, terminal, occupation-centered of less than baccalaureate degree level, and oriented toward math and science. Emphasis was upon skill and ability to make practical applications of theoretical knowledge in performing specific tasks in a specialized field and upon technical and cognitive skill rather than manipulative skill.

3306. HAMILTON, WILLIAM HENRY. Competencies in Agriculture Needed by Males Employed in Retail Feed Distribution. Thesis, M.S., 1964, Iowa State University of Science and Technology. 126 p. Library, Iowa State University of Science and Technology, Ames.

Purpose.--To determine the agricultural competencies needed by males employed in retail feed distribution and the degree of competency needed and possessed by employees in each competency. To identify employment opportunities in the industry in Iowa.

Method.--A panel of 15 selected managers of outstanding feed dealerships in Iowa identified the important agricultural and non-agricultural competencies needed by males in retail feed distribution. A questionnaire was developed from the list and submitted to managers and employees of outstanding feed dealerships in Iowa with instructions to indicate the degree of competence needed and possessed in the competencies listed. Responses from 140 of them were analyzed using mean scores. An additional questionnaire was developed and submitted to a stratified random sample of 445 Iowa feed dealers, asking each to indicate: the number of persons employed in 1958 and 1963, the number of persons to be employed in 1968, and the ages of each employee presently employed.

Findings.--Of the 41 agricultural competencies identified, 22 were understandings and 19 were abilities. Of the identified competencies 25 pertained to farm abilities and understandings and 16 pertained to dealership operations. Highest overall scores for competencies needed for all groups were found for the ability to analyze a farmer's credit potential and when to extend credit, the ability to communicate with farmers; the ability to accurately compute formulations for custom mixes with various size lots of grain delivered for processing; the ability to recognize potentially good customers; and an understanding of animal nutrition, health and sanitation. In 83.9 percent of all the competency ratings, the competency needed was higher than the competency possessed.

A comparison of the employer's evaluation scores for employees who had and those who had not had vocational agriculture in high school were significantly different both from the degree the competency was needed and possessed. Scores for the degree the competency was possessed were lower for the employees who had had vocational agriculture. Comparisons of scores for the degree competencies were needed and possessed by managers grouped by educational achievement were significantly different. Scores, in each case, increased as the educational level of achievement increased. For managers grouped according to years of farm background, scores for competencies-possessed increased as years of farm background increased. When the employees were grouped by farm background, their scores for the self-evaluation of degree-possessed increased as years of farm background increased.

An estimated 12,530 males were employed full-time in the feed, grain, and fertilizer dealerships in Iowa in 1963. The anticipated employment in 1967 was projected to be approximately 15,700 men. New employees plus anticipated replacements for retiring workers resulted in an estimated 1,060 job openings in the industry each year in Iowa.

3307. HANNEMANN, JAMES W. The Effectiveness of Teaching Parliamentary Procedure Through the Use of Programed Instruction. Thesis, M.S., 1964, Cornell University. 115 p. Library, Cornell University, Ithaca.

Purpose.--The purpose of this study was to test the following hypotheses: (1) programed instruction is an effective method for teaching parliamentary procedure to vocational agriculture students, and (2) there is a positive relationship between the time required by the students to complete the parliamentary procedure program and their score on the criterion examination.

Method.--A programed booklet titled "Fundamentals of Parliamentary Procedure" was written. A criterion examination based on the subject matter content of the booklet was constructed. The reliability of the criterion examination was determined by administering the examination to 95 Agriculture Three and Four students representing 12 schools in South Dakota. A reliability coefficient of .96 was obtained when the findings were subjected to the Kuder-Richardson Formula Number Twenty based on an item analysis.

A random sample post-test-only-control group design was used to determine the effectiveness of the programed instruction booklet. The experimental group that used the programed booklet consisted of 200 students representing 13 schools in South Dakota. The control group consisted of 183 students representing 12 schools in the same State.

Findings.--The mean post-test score of students in the experimental group was 59.6 and the mean post-test score of those in the control group was 46.6. A comparison of post-test scores in the experimental and control groups using a *t*-test of significance, revealed a *t*-value of 7.67 which was significant at the one percent level. On this basis, it was concluded that programed instruction was an effective method of teaching parliamentary procedure.

A correlation of 0.37 was obtained when the scores of the experimental group and the time required to complete the booklet were subjected to the product-moment correlation formula. The r value was subjected to a *t*-test of significance and a *t*-value of 5.66 was obtained which was significant at the one percent level.

3308. HANSON, ROLAND J. Special Young and Adult Farmer Programs in Wisconsin. Thesis, M.S., 1965, University of Wisconsin. 85 p. Department of Agricultural and Extension Education, University of Wisconsin, Madison.

Purpose.--To analyze special programs of young and adult farmer education in Wisconsin. Major segments of the study dealt with factors pertinent to attendance at night classes in order that a more complete understanding of the total program could be gained.

Method.--The group studied consisted of 18 special young and adult farmer programs in Wisconsin. Material was gathered from questionnaires completed by the instructors of these programs and from the tabulation of statistical information supplied by them on the 1963-64 final reports on file in the offices of the State Board of Vocational and Adult Education.

Findings.--There were 20 special young and adult farmer programs in Wisconsin at the time the study was completed. All instructors used a long-term plan three to six years in setting up their programs. Only two of the school districts charged a membership fee of enrollees in the programs, although six instructors believed that a fee should be charged. Advisory councils of three to fifteen people, the majority of whom were members of the program, served 10 of the programs. The major problems confronting the instructors centered around selection of the course of study and class attendance.

The most preferred method of determining units of study was to survey the farmers' needs. Personal contact was rated by the instructors as being the most used and the most valued method of increasing enrollment. The four methods most used and of the most value in maintaining attendance at classes were: (1) personal contact, (2) letters and postcards, (3) review of the course outline at the first meeting, and (4) recruitment by class members who had attended previous courses.

Of the 926 farmers enrolled in the 8 major courses of study offered during the 1963-64 year, 82.6 percent attended at least 60 percent of the meetings. The average attendance per program ranged from 59 to 90 percent with four programs averaging about 81 percent and five programs below 69 percent.

There were 15 percent more full-time instructor programs in the high attendance group than there were in the low attendance group. The programs in the high attendance group had been in operation an average of 1.6 years longer than the low attendance programs. Those instructors were, on the average, six years older and had an average of about eight years more teaching experience than the instructors of the low attendance programs. The average class duration in the high attendance group was 8.1 months as compared with 10.4 months for the low group. Instructors of the high group conducted an average of about three-fifths more farm visits per enrollee than did the other instructors.

3309. HASH, JOHN ALEX. An Acceptable Teaching Load in Vocational Agriculture as Viewed by School Administrators and Agricultural Educators. Thesis, M.S., 1964, Cornell University. 173 p. Library, Cornell University, Ithaca.

Purpose.--(1) To determine what constitutes an acceptable teaching load for a teacher of vocational agriculture in southwest Virginia as viewed by division superintendents, school principals, supervisors and teacher trainers in agricultural education, and experienced teachers of agriculture, and (2) to compare the views of each of these five groups with the actual present teaching load.

Method.--A mailed questionnaire was used to obtain the data. The sample consisted of 18 division superintendents, 48 school principals, 9 state supervisors, 8 teacher trainers, and 58 experienced teachers of agriculture. Responses from each group were 94.4, 97.9, 100, 100, and 87.9 percent, respectively. For all five groups combined 132 (93.6 percent) persons responded.

Five null hypotheses relating to in-school enrollment, young farmers enrollment, adult farmer enrollment, agricultural employees off-the-farm enrollment, and hours worked per week were tested by one-way analysis of variance with rejection at the 5 percent level of probability. When a significant F value was obtained by analysis of variance, differences among the means of the five groups were tested by Duncan's new multiple range test as extended by Kramer for unequal "n's." The comparison of present teaching load with the perceptions of the respondent groups employed Dunnett's multiple comparison procedure for comparing several treatments with a control. Generalizations were made to a somewhat hypothetical population in the bordering mountainous counties of Kentucky, North Carolina, and Tennessee with populations that resembled the sample closely in all respects considered relevant by the investigator.

Findings.--Both division superintendents and school principals preferred a significantly higher enrollment of in-school students than did the teacher trainers and agricultural teachers. It was not possible to demonstrate a difference on this variable between the following groups: teacher trainers, agricultural teachers, and state supervisors; state supervisors and school principals; state supervisors, school principals, and division superintendents; and school principals and division superintendents. The four null hypotheses relating to young farmers, adult farmers, and agricultural employees off-the-farm enrollments and hours worked per week could not be rejected.

There were no significant differences between the present teaching load as measured by in-school enrollment and the views of each group of division superintendents, school principals, state supervisors, and agricultural teachers. Only the comparison between the means of the teacher-trainer group and the present in-school enrollment yielded a significant difference. Comparisons of the present hours worked per week with those which the respondent groups considered to be correct yielded a significant difference at the one percent level of probability for all five comparisons.

The following conclusions were drawn: (1) An acceptable teaching load is 35 to 42 in-school students, 13 to 17 young farmers, and 14 to 22 adult farmers; (2) High school students, young farmers, and adult farmers should receive approximately 70, 18, and 12 percent, respectively, of the vocational agriculture teacher's instructional time; (3) More research should be conducted before any valid conclusions regarding agricultural employees off-the-farm may be drawn; and (4) The teacher should perform all professional duties and responsibilities within a 46-hour week, which is 9 hours less than the mean working hours reported by the sample.

3310. HEIMLICH, RICHARD E. The Non-Vocational Programs in Agriculture in the Public Schools in Ohio. Thesis, M.Sc., 1964, The Ohio State University. 70 p. Library, The Ohio State University, Columbus.

Purpose.--To identify the number and nature of non-vocational agriculture courses being offered in the public schools of Ohio and to determine the attitudes of administrators toward agricultural courses.

Method.--A questionnaire was developed and sent to all schools in Ohio listing a non-vocational agriculture program in the 1963-64 school year. A second questionnaire was developed and sent to administrators of one-fifth (150 schools) of the public high schools that did not offer a program in agriculture.

Findings.--Of the 1,083 public high schools in Ohio, only 21 offered programs in non-vocational agriculture. The programs included: five in conservation offered in urban areas of the state, four in horticulture in the Cleveland area, and twelve in general agriculture offered in urban areas and in rural areas not served by vocational agriculture programs.

The number of students enrolled in the non-vocational agriculture courses ranged from 4 to 93. Average enrollments in the 21 programs were: conservation, 54; horticulture, 30; and general agriculture, 28.

The courses were from one to four years in length. They were most frequently offered in the 11th and 12th year. The only pre-high school agriculture course offered was taught at the 8th grade level.

Non-vocational agriculture was most frequently offered for two semesters, five periods of instruction per week, with the most usual length of periods being 45 minutes. The courses were offered as an elective to both boys and girls in 16 of the 21 schools.

The primary purposes of the programs were to develop understandings and appreciation of conservation, horticulture, and general agriculture. Textbooks and bulletins were generally used, but there was no preferred textbook. Projects were not generally required for students. Laboratories and field trips were used in most programs. Extended service was not used to conduct the non-vocational agricultural programs. Neither was extended service preferred by the teachers.

Few school administrators were planning the addition of an agricultural program to the school curriculum. Most school administrators appeared to be not well informed concerning the possibilities of an agricultural program. They considered an agricultural course to be of value only to students who intended to farm.

3311. HILL, RONALD E. The Present Occupational Status of Oklahoma High School Vocational Agriculture Graduates Over the Past Five Year Period From 1959 to 1963. Thesis, M.S., 1964, Oklahoma State University. 49 p. Agricultural Education Department, Oklahoma State University, Stillwater.

Purpose.--To evaluate the present program of vocational agriculture by determining the occupational status of the graduates.

Method.--A random sample of one-third of the vocational agriculture departments in Oklahoma was taken. A schedule was sent to each, listing the names of their graduates for the five year period and occupational categories to check for each one. Ninety-two percent of the schedules were returned.

Findings.--There were vast differences among the areas of the State. More students returned to farms in beef and wheat areas. It was found that 18 percent of the graduates were farming. About 11 percent were in off-farm agricultural occupations, 12 percent were enrolled in agricultural colleges, and 41 percent were in some phase of agriculture.

The type of residence background a graduate had was, apparently, quite determinative of his future agricultural occupation. Those with a background of "country farm" were in the group having the highest percentage, by far, entering farming or working in off-farm agricultural occupations. The next highest percentage was the group with "town non-farming" background; the "country non-farm" group had the lowest percentage.

3312. HOENHAUS, WILLIAM EDWARD. An Evaluation of the Vocational Agriculture Farm Management Program of Southern Minnesota. Thesis, M.A., 1964, University of Minnesota. 41 p. Department of Agricultural Education, University of Minnesota, St. Paul.

Purpose.--To determine the impact of the existing Vocational Agriculture Farm Management Program on the co-operating farm families of southern Minnesota and to pinpoint some of the changes they would like to have made in the program.

Method.--A survey was taken of 140 Vocational Agriculture Farm Management Program co-operators from six southern Minnesota school systems. The survey questions were oriented toward what type of farm family participates in the management program, how they make use of summary information, and what changes should be made in the program. Ninety-one survey forms were summarized for the study.

Findings.--The average Vocational Agriculture Farm Management Program co-operator was 38 years old and had been farming 12 years. Forty-three percent had participated in the program for four years or more. Seventy-one percent had been contacted personally by the instructor for participation in the management program. The co-operators used their farm business summary information as an indicator of their business progress and for making major management decisions. Seventy-one percent of the farm families found on-the-farm instruction very valuable. Classroom instruction was considered very valuable to 42 percent of the co-operators. The majority of the farm families had an average increase in net worth of $2,425.90 per year while participating in the program. Findings were of such significance as to warrant recommendations for improvement in the Vocational Agriculture Farm Management Program in southern Minnesota. The instructional program in farm management should be expanded to include more beginning and older established farm families. Instructional techniques should be improved by better preparation for group instruction in the classroom. Farm visits should be scheduled with established goals so that the farm family may be given more assistance in making adjustments in their farm business.

3313. HOERNER, THOMAS ALLEN. Factors Related to Employment of Iowa State University Graduates in Agricultural Education. Thesis, Ph.D., 1965, Iowa State University of Science and Technology. 170 p. Library, Iowa State University of Science and Technology, Ames.

Purpose.--To determine the factors that influenced the employment tenure of men who are qualified to teach vocational agriculture. Secondary purposes of the study were (1) to determine the factors that influence the decision of teachers to leave the vocational agriculture teaching profession, (2) to determine the relationship between having had high school vocational agriculture and tenure in teaching vocational agriculture, and (3) to determine the relationship between employment tenure in teaching vocational agriculture and a group of selected factors.

Method.--The study included 1,022 persons who graduated within the period, January 1, 1940 to July 1, 1964. Data were obtained from the graduates' permanent college record and from an eight-page questionnaire that was mailed to the graduates. Information requested in the questionnaire pertained to the graduates' home backgrounds, high school and college records, first employment, and 1964 employment information. Fifteen variables were selected from the data collected for two groups, the 1951-52 and the 1957-58 graduates. Two 15-variable intercorrelation matrixes were produced from this data. Graduates' responses to a list of 24 factors that influenced their decision to leave the vocational agriculture teaching field were statistically treated by factor analysis. From the 24 factors, 5 were selected for correlation with 15 selected variables pertaining to each graduate's high school and college background, first employment, and 1964 employment.

Findings.--The major findings were: (1) 89 percent of the graduates were farm-reared; (2) 59.3 percent of the parents of graduates were farm owner-operators or managers; (3) 53 percent of the graduates had completed one or more semesters of vocational agriculture in high school and 33.4 percent had completed seven to eight semesters; (4) family members were responsible for influencing 44.5 percent of the graduates' attendance at college, and parents financed the college education for one-fourth of the graduates; (5) 43.3 percent of the graduates were aware of the vocational agriculture teaching profession prior to college enrollment; (6) average tenure in vocational agriculture teaching was three years for all graduates, whereas, the graduates who had entered teaching directly after graduation taught an average of 5.4 years; (7) the 186 graduates (18.2 percent) who were teaching in 1964 had taught an average of 7.0 years; (8) 654 graduates (64.0 percent) had taught vocational agriculture at sometime since graduation, whereas, 570 graduates (55.8 percent) had entered teaching directly after college graduation; (9) years taught vocational agriculture when compared to membership in professional organizations produced a positive value significant at the one percent level; (10) years taught vocational agriculture when compared to advanced educational status and curriculum enrollment at Iowa State University yielded positive coefficients of correlation; (11) first employment areas of graduates included: vocational agriculture teaching, 56 percent; G.I. on-farm training program, 8.7 percent; extension service, 5.9 percent; farming, 5.5 percent; and high school teacher other than vocational agriculture, 2.6 percent; (12) mean first employment income was $4,524 for the vocational agriculture instructors, whereas, the mean income for all graduates was $4,440; (13) employment areas in 1964 included: vocational agriculture teaching, 18.2 percent; farming, 10.3 percent; feed and seed business, 7.2 percent; extension service, 6.8 percent; high school teacher other than vocational agriculture, 6.7 percent; and government work, 5.2 percent; (14) average income in 1963 for all graduates was $8,002, whereas, vocational agriculture instructors reported a mean 1963 income of $7,000; (15) factors which had the greatest influence on the graduate's decision to enter the first employment area were: felt best trained, opportunity to work closely with people, freedom and independence of the job, and salary; (16) the factors having the greatest influence on the graduate's decision to enter the 1964 employment area were: felt best trained, freedom and independence of the job, salary, working closely with people, opportunity for advancement, and security; and (17) the factors rated as having the greatest influence on their decision to leave the profession by the graduates who had entered vocational agriculture teaching, but left for other occupations were: long hours and evening responsibilities, salary and advancement opportunities, community factors, interpersonal problems, and failure to adjust to the teaching assignment.

3314. HOOVER, N. K., McCLAY, D. R., and STEVENS, G. Z. Technical Education Needs of Persons Engaged in Agricultural Occupations, A Preliminary Report. Staff Study, Teacher Education Research Series, Volume 6, Number 1, 1965, The Pennsylvania State University. 38 p. Department of Agricultural Education, The Pennsylvania State University, University Park.

Purpose.--To identify agricultural occupations and job titles in Pennsylvania and to estimate the present numbers of employees and annual entry opportunities; to determine competencies needed for entry and advancement and job characteristics such as salary, minimum age, labor law and union restrictions, required education and experience, and licensing and certification requirements; and to group occupations and job titles for which there are common technical education needs.

Method.--A list of all businesses in 17 counties was obtained from the Pennsylvania Department of Labor, Bureau of Employment Security. In each county, the area supervisor of agricultural education appointed a committee made up of representatives from agricultural education, agricultural extension, county school office, local chambers of commerce, county commissioners, an agricultural business, a non-agricultural business, school administrators, guidance counselors, and the Bureau of Employment Security. The committee selected from the total list of businesses those that were thought to have employees who needed agricultural competencies. The committee added other businesses and services not included in the B.E.S. list. Businesses were categorized into eight occupational families. Teachers of agriculture and area supervisors interviewed a random sample of businesses. The percent of businesses interviewed varied from 25 to 50 depending on the number of teachers in the county and the number of businesses in each category.

Findings.--In the 17 counties, 2,142 selected businesses employed 26,380 persons. Agricultural competencies were needed by 13,668, approximately 50 percent. Of the employees who needed agricultural competencies, approximately 10 percent were working at the professional level, 10 percent were working at the managerial level, 12 percent were working in sales, and 58 percent were working at the skilled or semi-skilled level. Approximately 30 percent of them were employed in the farm machinery or in the farm supply and equipment occupational groups. Approximately 25 percent of the employees were working in ornamental horticulture occupations.

Seventy-five job titles account for 85 percent of all workers expected to be hired in the next five years. Twelve skilled and semiskilled titles represent over 50 percent of the expected turnover, not increase, in the same period.

3315. HORNER, JAMES T. An Experiment to Compare Effectiveness of
Various Means of Enlisting Participation in Young Farmer-Rancher 0
Short Courses. Staff Study, 1965, University of Nebraska.
20 p. Department of Agricultural Education, University of
Nebraska, Lincoln.

Purpose.--To compare relative effectiveness, in terms of investment of time and money, of various channels of communication for enlisting participation in short courses.

Method.--In 45 randomly selected communities 15 experimental treatments and a control were employed. Each treatment consisted of a different combination of channels of communication and was applied to one randomly selected set of three communities. Various combinations of three basic approaches or methods of contact were compared. The three basic approaches were: (1) contact by University faculty members, (2) contact by local leaders, and (3) mass media including the mails.

Findings.--The total efforts greatly increased (from 14 to 59) the enrollments in short courses. Although the results are insufficient for generalization, they tend toward the opposite of the original prediction which was that the percentages enrolling in short courses would be positively correlated with the degree of personal contact. Personal, face-to-face contact with prospective enrollees is far more expensive and markedly less fruitful in terms of enrollees per number of contacts. The least expensive, yet most efficient method of recruiting, seemed to be mimeographed letters to individuals judged by local agricultural educators to be promising prospects. It was observed that most of those who actually enrolled in the short course came from farms and ranches with a rather high capital outlay. Perhaps economic backing, or other latent circumstances exist, and a minimum of stimulus, such as a mimeographed letter or a magazine article, will trigger action.

3316. HOUSEHOLDER, WILLIAM ALLEN. An Evaluation of Work Experience Programs as an Element of Agricultural Education in a Panamanian School of Agriculture. Thesis, Ph.D., 1965, Michigan State University. 112 p. Library, Michigan State University, East Lansing.

Purpose.--(1) To determine the effectiveness of individual work experience programs at the National School of Agriculture, Divisa, Panama; (2) to determine some of the factors relating to the graduate's satisfaction with his work; and (3) to determine if the agricultural leaders of the country react favorably to the school.

Method.--Data for the study were collected from 121 Panamanians who were graduated from the National School of Agriculture since 1960 and from 51 of their employers. Of these, 83 percent of the graduates and 71 percent of the employers responded to questionnaires.

One part of the graduate questionnaire included an experience rating scale through which graduates compared new individual work experiences, those introduced into the program of instruction since 1958, with the older and more traditional agricultural field practices and academic experiences. The questionnaire also included a scale which indicated job satisfaction. The employer questionnaire included a series of agreement-disagreement statements which ascertained how employers felt about the school. Chi square and t-test were the major statistical tests in analyzing the data.

Findings.--Regardless of how the data were classified, the graduates' mean rating scores of their individual work experiences were significantly higher than mean scores for either traditional vocational or academic experiences. Graduates rated those experiences in which they participated on an individual basis consistently higher than those experiences that required group participation. Graduates were more dissatisfied with their jobs than average USA workers but less dissatisfied than workers in some other cultures including Mexico and European countries. Factors relating to job satisfaction commonly found among American workers are applicable to young Panamanians launching work careers in agriculture. Agricultural leaders of Panama emphasized the need for more skill training in agricultural production and industrialization, and they believed that there should be more opportunities in adult farmer education.

3317. HOYT, LINDLEY JOHN. Competencies in Livestock Marketing Needed by Farmers. Thesis, M.S., 1965, Iowa State University of Science and Technology. 120 p. Library, Iowa State University of Science and Technology, Ames.

Purpose.--(1) To determine the competencies needed by beef, sheep, and swine producers to be successful in livestock marketing, (2) to determine certain characteristics of successful producers and their relationship to degree of competency needed and possessed, and (3) to determine educational needs of future replacement beef, sheep, and swine producers in the area of livestock marketing.

Method.--A list of 74 competencies in livestock marketing was developed by a panel of livestock specialists and submitted in questionnaire form to a selected sample of 100 beef, 100 sheep, and 100 swine producers in Iowa, all of whom were classed as outstanding producers. Of the competencies identified, 35 were abilities and 39 were understandings. Responses (80 percent) indicating degree of competence needed and possessed were analyzed using mean scores.

Findings.--For the beef producers, highest mean scores for degree of competence needed were found for the understandings of: county, State, and national beef promotional organizations; consumer demands for beef; and livestock loss and factors causing such loss. Highest rated abilities were: to estimate grade and yield of cattle and to figure returns above costs.

In the area of sheep production, highest mean scores for degree of competence needed were found for the understandings of: consumer demand for lamb, government wool support programs, livestock loss and factors affecting such loss, and the ability to do a good job of buying lambs.

For the swine producers, highest mean scores for degree of competence needed were found for the understanding of the influence of heritability factors on market grade or dressing percentage and for the abilities: to figure feed conversion of pigs above 200 pounds, to evaluate methods of marketing and select the method providing the greatest return, and to select the market which gives the best return.

There were at least 23 competencies necessary for success in beef marketing, 25 in sheep marketing, and 19 in swine marketing. Comparisons among groups showed the following relations between total overall scores for competence needed and possessed: (1) livestock producers with fewer years of experience had wider differences in scores than those with more experience; (2) sheep producers had wider differences in scores for men with more formal education, whereas beef producers had wider differences in scores for those with less formal education; (3) increased years of vocational agriculture tended to decrease the differences; (4) men who had not had training in livestock production obtained in young farmer, adult evening class, or veterans on-farm training programs had wider differences in scores than those who had had such training; (5) the smaller the size of the livestock enterprise the wider the scores differences tended to be, except with the sheep producers where the reverse was true; (6) producers who bred grade and combination livestock tended to have wider differences in their scores than producers of purebred and crossbred.

3318. HULL, WILLIAM LEE. A Procedure for Sequencing Self-Instructional Materials for Concept Attainment of Human Relations Abilities in Agricultural Business Occupations. Thesis, D.Ed., 1965, The Pennsylvania State University. 87 p. Library, The Pennsylvania State University, University Park.

Purpose.--To develop and test a factor analysis procedure for sequencing self-instructional materials associated with concept attainment. Effects of a computer generated "psychological" sequence compared with a random sequence of concepts on sequential decision-making by three achievement levels of students were determined.

Method.--The first phase of the experiment included 126 students in 7 randomly selected Pennsylvania high schools. In each school three randomly sequenced self-instruction booklets were presented to randomly assigned equal numbers of junior and senior students in vocational agriculture classes. The booklet dealt with 10 human relations concepts which employees in agricultural businesses would need to know. Each concept presentation included a description of the term, an example of its use, and a case study of an agricultural business situation illustrating the concept.

The students responded to a set of three questions following the case and to three questions of a more general nature. The criterion test included 30 questions relating to the 10 human relations cases and 30 questions on the generalized concepts. Each student responded to the first question in the set of three and one of the other two. This mechanism made possible an evaluation of each student's pattern of responses. The student responses were factor analyzed to generate the psychological sequence of concepts.

The psychological sequence of concepts was tested against a random sequence with 294 junior and senior students in 15 schools in the second phase of the experiment. The two sequences were assigned randomly to the students in each school. Reading comprehension test scores and human relations aptitude test scores were used as controls in an analysis of covariance design. The .05 level of significance was used. A t-test of uncorrelated proportions was used to determine the effects of sequence within the response patterns. Rank-difference correlations were used to measure sequential decision-making.

Findings.--When compared with the random sequence, the psychological sequence did not result in significantly higher scores at the .05 level of significance when all of the data were considered. In all comparisons except one, scores of the students using the psychological sequence booklet were larger, apparently influenced by higher reading comprehension and aptitude test scores. Within groups, differences between the covariate scores were not significant.

The effect of sequence in instructional materials is specific to the achievement level of the students and the difficulty level of the materials. The low achievement students showed the greatest difference on the questions specific to the cases, in favor of the psychological sequence. Responses from the high achievement students using the psychological sequence resulted in significant differences when they were evaluated by the questions relating to the concept generalizations.

The generalization questions were more difficult than the questions specific to the cases. This suggests that sequence becomes more important as difficulty of the materials increases.

3319. ISLAM, A. F. M. SERAJUL. An Analysis of the County Program Building Organization in One of the Texas Agricultural Extension Districts. Thesis, M.S., 1964, Texas A & M University. 134 p. University Library, Texas A & M University, College Station.

Purpose.--The primary purpose of the study was to determine the characteristics and effective practices and procedures of the county program building committee in Texas Agricultural Extension District Number 10. A list of ten major objectives of the study were given.

Method.--A questionnaire was mailed to the 36 county agents in District 10 of Texas. An interview schedule was used to obtain data from 65 county committee members. Both groups responded to similar items concerning (a) characteristics, functions, work areas, performance and effectiveness of the county program building committee; (b) procedure and practices for developing, implementing, and evaluating county extension programs; and (c) criteria of participation of committee members in county program building processes. The 65 committee members were randomly selected from a population of 650. The data were analyzed for significance of differences between the groups.

Findings.--Committees were composed of both men and women, and farmers and non-farmers. The majority of the members were between 40 and 59 years of age. Of the counties studied, 96 percent had program building committees which ranged in size from 11 to 90 members. The county agents and the committee members differed significantly in their opinion regarding items of duty, work-areas, and effectiveness of the committees. The performance of the committees was rated higher by the agents than by the members themselves. Some of the agents and committee members were skeptical about the implementation of the county programs. Most members were not satisfied with current working programs. It was recommended that committee members be selected on consideration of age, sex, education, occupation, and extension experience.

3320. JOBES, RALEIGH ALVIN. The Role of the Teacher of Vocational Agriculture in the Vocational and Educational Guidance of Students Enrolled in Vocational Agriculture in the High Schools of Arizona. Thesis, M.Agr.Ed., 1964, University of Arizona. 111 p. Department of Agricultural Education, University of Arizona, Tucson.

Purpose.--To determine: (1) what vocational and educational guidance activities a jury of experts felt teachers of vocational agriculture should perform for their students, (2) what activities the teachers felt they should perform for their students, and (3) what activities were performed by the teachers for their students.

To determine the opinions of a jury of experts and teachers of vocational agriculture relative to the need for professional training in guidance and counseling and their recommendations for courses in these areas.

Method.--Data were collected about the performance of 55 selected guidance activities from a jury of 15 persons and from 44 teachers of vocational agriculture in Arizona. Jury members were interviewed. An opinionnaire was sent to the teachers.

Findings.--The jury and teachers of vocational agriculture agreed that teachers of vocational agriculture should perform 11 of the 55 guidance activities. They are as follows: (1) use various news media to inform the students about the vocational agriculture program, (2) keep a current file of catalogs from vocational, technical, and collegiate institutions which offer courses to prepare students for occupations in agriculture, (3) teach units on occupations in agriculture, (4) maintain a library of information about occupations in agriculture, (5) invite representatives of agricultural occupations to discuss their occupation with the class, (6) encourage participation of seniors in "Senior Day" at the agricultural college, (7) conduct field trips to observe people working in agricultural occupations, (8) help students in vocational agriculture resolve vocational problems whenever possible, (9) watch for symptoms of student maladjustment and discuss with the student's counselor, (10) cooperate with the counselor in helping students resolve problems, and (11) maintain a list of potential jobs in agriculture for students desiring job placement training.

There was general agreement that 21 additional activities should be performed. Teacher responses indicated that all teachers performed activities 3 and 4 and that most teachers performed items 8 and 10.

All jury members and 72.7 percent of the teachers of vocational agriculture felt that guidance courses should be included in the undergraduate teacher training program for teachers of vocational agriculture. Most jury members and most teachers of vocational agriculture felt that guidance courses should be included in the graduate program for teachers of vocational agriculture.

3321. JUDGE, HOMER V. Employment Opportunities and Needed Competencies in Off-Farm Agricultural Occupations in Massachusetts. Staff Study, 1965, Massachusetts Department of Education. 47 p. Division of Vocational Education, Massachusetts Department of Education, Boston.

Purpose.--(1) To determine the present number of employees and annual entry opportunities in off-farm agricultural occupations in Massachusetts, (2) to determine the competencies required of workers, and (3) to ascertain the instructional needs of those individuals seeking entry and advancement.

Method.--Names and addresses of 3,479 firms and employers with businesses related to agriculture were obtained from the State Department of Employment Security. A ten percent random sample of the 3,479 firms and employers was taken. Businesses and employers were stratified according to 13 major group classifications. The State was divided into five geographical areas for survey purposes. All information and data were collected by personal interviews with employers, using two interview schedules.

Findings.--Three of the largest areas of off-farm agricultural employment in terms of number of workers employed were horticulture, farm implements and equipment, and food distribution and processing. The number of workers identified who needed agricultural competencies in the performance of their jobs was found to be greater than the total number of persons engaged in production farming in the State. Employers expressed a need for better trained workers in off-farm agricultural occupations and a desire for their present employees to have in-service training. Interviewers reported that employers of off-farm agricultural workers lacked information concerning opportunities to arrange for in-service education.

3322. KAHLER, ALAN ARNOLD. Competencies in Agriculture Needed by Males Employed in Retail Farm Machinery Distribution. Thesis, M.S., 1964, Iowa State University of Science and Technology. 201 p. Library, Iowa State University of Science and Technology, Ames.

Purpose.--To determine the important agricultural competencies needed by males employed in retail farm machinery distribution, the degree of competency needed and possessed by employees in each competency, and the employment opportunities in the industry in Iowa.

Method.--A panel of 15 of the most progressive farm machinery dealers in Iowa listed the important agricultural competencies needed by employees in the various occupational areas in the retail farm machinery industry. A questionnaire was developed from the list and submitted to 100 outstanding dealers in Iowa and their employees with instructions to indicate (1) the degree the competencies were needed to effectively perform the functions of their jobs and (2) the degree the competencies were possessed by the employee. An additional questionnaire was developed and sent to all farm machinery dealers in the State asking each dealer to indicate: the number of persons employed in 1958 and 1963, the number of persons to be employed in 1968, and the ages of each employee presently employed. Responses indicating the degree of competency needed and possessed were analyzed using mean scores.

Findings.--Of the 56 competencies listed by the panel, 31 were understandings and 25 were abilities. Thirty-one competencies pertained to dealership management and service, 14 were in the area of farm management and 11 were in the areas of livestock and crop production. Highest overall scores were found for the understanding of the types of machinery used in the local farming area, machinery financing procedures, economic reasons for use of labor-saving machines, capabilities of present and prospective farm machines, farm credit procedures and the ability to manage trade-in inventory, estimate trade-in values of used machinery, make machinery valuations, adapt machinery size to farm operation, and locate failures and make repairs quickly and efficiently. Competencies in farm management had the highest consistent scores when compared with the scores of competencies in other areas. Employer and employee scores for all competencies were higher for the degree of competency needed than for the degree of competency possessed. Employee scores were higher than employer scores for both degree competencies were needed and possessed.

As years of farm experience of managers, clerical, and parts and service employees increased, the scores for degree of competency needed and possessed increased. Conversely, the degree of competency needed and possessed decreased for sales employees as years of farm experience increased. Both the degree of competency needed and possessed for each competency decreased as the size of business increased. The highest scores were found for employees in businesses with gross volumes of sales under $300,000.

According to this study, an estimated 6,260 persons were employed in 1,082 dealerships in 1963, whereas 5,802 persons will probably be employed in 834 dealerships in 1968. By 1968, an estimated 598 new employees will be needed to fill the new job openings in the 834 probable dealerships, and 361 employees will likely be needed to replace retiring workers. Of these 959 new employees and replacements, 423 will be needed as service employees, 139 as managers, 170 as salesmen, 70 as clerical workers, 95 as parts men, and 53 as departmental managers.

3323. KANTASEWI, NIPHON. Experiments in the Use of Programed Materials in Teaching an Introductory Course in the Biological Sciences at the College Level. Thesis, Ph.D., 1964, The Pennsylvania State University. 178 p. Library, The Pennsylvania State University, University Park.

Purpose.--To compare the effectiveness of three methods of teaching the subject matter of the middle third of an introductory course in microbiology. The methods were (1) conventional presentation of seven lectures by the course instructor, (2) use of a linear programed text during class time without and with class discussion, and (3) use of the same programed material outside of class with the class time devoted to assigned problems constructed from the text or to discussion led by a graduate assistant.

Method.--The 126 students enrolled in the Bacteriology 6 course in the 1963 winter term were assigned randomly to the first method and to the two variations of the second method. In the 1963 spring term there were 109 students assigned randomly to the first method and to the two variations of the third method. Students in all groups had access to the textbook and attended weekly laboratory sessions.

There were 807 frames in the linear programed text written from the instructor's lecture material and tape recorded in the prior fall term. The lectures were on antibiotics, microbiology of water, milk, soil and sewage, mycology and industrial microbiology of milk products and food spoilage. The student grade in the examination on the first third of the course was used as an adjusting variable in covariance analysis of scores on the examination written by the course instructor for the material taught during the experiment.

Findings.--The adjusted mean scores of the three groups in the winter term were 81.3, 79.2, and 81.5. The differences were not significant at the .05 level. Similarly, the adjusted mean scores of 60.4, 60.8, and 60.0 for the three groups in the spring term were not significantly different. The instructor in the spring term administered a more difficult examination, but the results corroborated the findings for the winter term which indicated that the linear programed materials were as effective as the conventional line lectures.

Regression of the student scores on the experimental middle third of the course on their scores on the first examination was significant. Bartlett's test showed the variances of scores in the three groups in each term to be homogeneous. Students who prior to the experiment expressed confidence in programed materials did not make higher scores. Classified by thirds on the first examination, the students in each treatment did not make significantly different scores. The programed materials were equally effective under each of the controls of the study.

3324. KATZ, GIDEON. Determining the Vocational Needs in Agriculture of Beginning and Prospective Farmers in Newly Developed Areas in Israel. Thesis, Ph.D., 1964, Cornell University. 250 p. Library, Cornell University, Ithaca.

Purpose.--(1) To identify principal farm jobs in the main production enterprises, (2) to determine the actual performer of these jobs on moshav farms, (3) to ascertain who in the future should perform these jobs (the ideal performer), (4) to classify the jobs in terms of their actual and ideal performer, and (5) to draw implications for curriculum development in rural education.

Method.--Comprehensive lists of farm jobs were compiled and verified by agricultural experts for the following enterprises: industrial crops, truck crops, plantations, poultry, dairy, and sheep production. The lists were transformed into questionnaires and mailed to extension agents who checked the ideal performer of each farm job on the moshav farms in their respective area. The actual performer of the jobs was ascertained in interviews with beginning farmers and instructors.

Five categories of performers were identified: the farmer himself, the farmer with guidance, local (village) experts, outside specialists, and "not performed" (or "should not be performed"). The mode for the actual and the ideal performer was computed for each farm job. Each farm job was assigned a "degree of specialization" in accordance with the mode for the ideal performer. The "urgency" of the job was defined in terms of the discrepancy between the actual and the ideal performers.

Findings.--Principal farm jobs varied considerably from one area to another. Beginning farmers failed to carry out many of the jobs ascribed to them. Although these jobs were not identical in all three areas, it was found that farm jobs concerned with record keeping, disease control, maintenance of constructions and conveniences, and operation of farm machinery were often not performed.

As a rule, managerial decisions were not carried out by farmers themselves but rather by farmers with guidance or by specialists. Selecting and purchasing supplies, grading and marketing, and operating tractors and machinery were generally delegated to local experts. There existed a considerable gap between the actual and the ideal performer of numerous farm jobs.

The farm jobs in each enterprise were classified according to their assigned degree of specialization and urgency, and implications were made concerning the organization of courses of study for beginning and prospective farmers in newly developed areas.

3325. KEBRET, MAKONNEN. The Contribution of Agricultural Education to the Rural Development of Ethiopia. Thesis, Ph.D., 1964, Cornell University. 215 p. Division of Agricultural Education, Cornell University, Ithaca.

Purpose.--(1) To analyze the present situation in Ethiopia and review the development of agricultural education in the world to serve as background information for determining appropriate guidelines and objectives for agricultural education for Ethiopia, (2) to recommend guidelines and objectives for agricultural education based on the review of materials and suggestions from a jury of agricultural education experts, (3) to propose how agricultural education would contribute to the rural development of Ethiopia, and (4) to develop a theoretical framework for administration in agricultural education.

Method.--The analysis of the present situation in Ethiopia and the review of literature in agricultural education was made through intensive library research. The formulated guidelines and objectives based on this review were submitted to a jury of experts for their criticism as a means of verification. After analyzing the criticisms of the jury, guidelines and objectives were developed to be used in guiding and implementing the agricultural education programs in Ethiopia. Some aspects of the role of agricultural education were criticially analyzed, and proposals were made as to their contribution to the rural development of Ethiopia. Further, a theoretical framework of agricultural education was developed.

Findings.--The technical backwardness in agriculture, the isolation of rural people from others in society, the rituals and practices of religion in the use of certain plants and animals, and the development of status through ownership of livestock, the large number of commemorative and feast days, the land tenure system, and the existing beliefs, values, and attitudes are some of the critical factors that are to be considered in the rural development of Ethiopia.

The recommended guidelines and objectives of agricultural education provide a basis in guiding and directing agricultural education programs for the rural development of Ethiopia. The majority of the jury of experts favored the introduction of agricultural education to orient and to educate the elementary and secondary school children, to train the young and adult farmers, and to educate prospective farmers and technical experts at the secondary and post secondary level. The experts unanimously agreed that the College of Agriculture should take the initiative to prepare the prospective teachers.

Among the urgent needs that face Ethiopia is the utilization of human and natural resources that are concentrated in the rural area. It was proposed (1) that through a proper agricultural education program the rural society should be acquainted with possible alternatives to better their situation and (2) that the government should take the lead in initiating intensive rural development programs.

In the light of the availability of managerial and technical skills necessary for efficiency in administration, centralized administration for agricultural education was recommended.

3326. KING, JOHN FREDERICK. The Development and Educational Application of Input-Output Data for Use in Programming Pennsylvania Swine Production. Thesis, M.S., 1964, The Pennsylvania State University. 46 p. Library, The Pennsylvania State University, University Park.

Purpose.--To provide information for teachers, county agents, and others to use in helping farmers to plan and evaluate commercial swine production by (1) summarizing records on various size swine enterprises, (2) compiling input-output data applicable to budgeting swine enterprises in Pennsylvania, (3) developing swine budgets at different levels of operating efficiency and prices, and (4) evaluating the effect on net returns of various types of swine enterprises.

Method.--Twenty-one Pennsylvania farmers who were engaged in commercial swine production mailed to the University each month in 1963 a report of physical production data relating to the swine enterprise. They used Part I of the Pennsylvania Farm Account Book to record receipts and expenses for the entire year and Part II to record beginning and ending inventories and depreciation schedules.

The data analysis included a detailed summarization of the year's business by size and type of operation, a listing of factors associated with success, and a presentation of efficiency data as input-output relationships.

Findings.--The unit cost of pork production decreased as the size of the enterprise increased from 5 sows farrowed twice per year to more than 80 sows. The decrease in unit cost was relatively constant up to 50 sows. The data beyond that size of enterprise was insufficient for prediction. Total net returns increased with size of business in situations of efficient production per sow.

Feed, the most important cost item, accounted for 78 percent of the total cost of production. Cost of feed per hundred weight of pork is as important as the physical feed conversion rate. Capital investment averaged $277 per sow and $24 per hog in finishing operations. One-fourth of the producer's lost money; one-half had net returns up to $3 per hundred weight of pork produced; and one-fourth realized a net return of $3 or more.

Two sets of data are needed for partial budgeting: physical input-output relationships and cost-price data. Basic budgets were constructed for three situations: one in which the sale price was increased one dollar, a second in which feed conversion was lowered by ten pounds per hundred weight of pork, and one in which the animals were fed to a finished weight twenty pounds higher. Each plan resulted in some increase in net income.

3327. KNUTI, LEO L. and OTHERS. Vocational and Technical Education Needs of Montana Youth and Adults. Staff Study, 1963, Montana State College. 88 p. Department of Agricultural Education, Montana State College, Bozeman.

Purpose.--To determine the needs of Montana youth and adults for vocational-technical education and to access existing programs, college and high school drop-outs, and employment opportunities for an expanded program of vocational education.

Method.--A panel of 16 consultants prepared and presented papers on related vocational subjects which were given at 3 area meetings. The consultants were school administrators, State department of education supervisors, college staff, State employment service personnel, vocational rehabilitation supervisors, industry representatives, the press, and students.

Findings.--One-half or more of Montana youth need high school and post-high school vocational-technical-practical arts education. While some excellent training programs were noted, deficiencies were found in other programs and facilities. A handicapped person under vocational rehabilitation had excellent training provided for him, half of it in facilities outside of Montana. Approximately a third of the labor force were women. Local opportunities for training and jobs for women appeared to exceed those for men. Only one-third of those who started college finished in a 4-year period. One in ten high school freshmen completed college. College drop-outs far exceeded high school drop-outs. Much latent interest in more comprehensive vocational-technical-practical arts education, largely on the part of lay people, was noted.

3328. KUNTZ, ROBERT H. A Study of Selected Characteristics of Trainees in Farm Mechanics Retraining Schools Under the Area Redevelopment Act in Oklahoma. Thesis, M.S., 1964, Oklahoma State University. 38 p. Agricultural Education Department, Oklahoma State University, Stillwater.

Purpose.--To identify characteristics for use in selecting students for future Area Redevelopment Act classes in farm mechanics.

Method.--Sixteen farm mechanics retraining schools for 255 unemployed or underemployed men were held in Oklahoma under the Area Redevelopment Act of 1961. Trainees were divided into five groups according to their success in gaining employment following training. The General Aptitude Test Battery was administered to trainees. Scores were used to determine the best indicators of success in farm mechanics. A comparison of the age and marital status of each group was made. For each of the three employed groups, the last regular salary before training was compared with the present salary. In each group eight different personal traits of trainees, as rated by local instructors, were also compared.

Findings.--When the study was conducted, eighty-seven percent of the trainees were employed; sixty-one percent were employed in occupations related to their training. The spatial aptitude test scores of trainees who were successful in obtaining "training related jobs" were significantly higher than those of the less successful groups. The sum of the scores for general intelligence, spatial aptitude, and finger dexterity tests used by the Employment Security Bureau in selecting trainees, were significantly higher for the successful group. GATB scores were not significantly different for the two groups.

A majority of the successful trainees were married, while the majority of the unemployed were single or divorced. There was no significant difference in the ages of the two groups. The majority of all the employed men were receiving a higher salary than their last regular salary before training. In the comparison of personal traits, the men who obtained "training related jobs" were rated highest in ability to learn. The unemployed groups were rated lowest in ability to learn. There was little or no difference between the groups in the other personal traits. The Employment Security Bureau did an adequate job of selecting trainees; however, future farm mechanics training schools might be even more successful if spatial aptitude test scores are given more weight than the general intelligence and finger dexterity scores in selecting trainees.

3329. LANGDON, CHARLES L. A Survey of Agricultural Occupations in Michigan. Staff Study, 1965, Michigan Department of Education. 12 p. Publication No. 550, Division of Vocational Education, Michigan Department of Education, Lansing.

Purpose.--(1) To identify present and emerging agricultural occupations, other than farming and ranching, for which vocational-technical agricultural education should be available; (2) to determine present and anticipated numbers of employees in these occupations; (3) to estimate the annual entry opportunities in these occupations; (4) to determine competencies needed for entry and satisfactory performance in these occupations; (5) to determine other characteristics of these occupations such as salary, minimum age for entry, union restrictions, labor laws, required experience, formal education; and, to determine continuing education needs of those employed in these occupations.

Method.--Survey forms were used to collect data. Form 1 was used to gather general information about the firm, and Form 2 was used to collect information regarding each agricultural job title listed on Form 1.

Findings.--The firms surveyed employed a total of 3,916 persons, 31.7 percent of whom had agricultural job titles. The firms expected to employ 1,543 agricultural workers within five years, an increase of 302 persons or 24.3 percent. The greatest increase (57.8 percent) was expected in the agricultural service occupations. The next greatest increase was expected at the sales level of employment with technicians and skilled workers needed in greater numbers.

It was possible in two cases to expand the study of the number of employees needed to a statewide basis. These were farm machinery sales and service businesses and nursery businesses. This resulted in an indicated annual need for 292 persons for expansion and 234 persons for replacement, or a total of 526 new employees per year in Michigan in farm machinery sales and service establishments. The indicated annual need by nurserymen for new employees was 194 for expansion and 241 for replacement, or a total of 435 new persons each year in the State.

Top salaries of professional workers, technicians, proprietors, managers, and sales people ranged from $700 to over $900 per month. The minimum age for entering the agricultural occupations studied ranged from a low of 20-21 years at the unskilled level to 25-35 years at the proprietors and managers level.

A farm background was a requirement or preference in 63.7 percent of all job titles listed in the survey. A preponderance of respondents listed "farm background" as a requirement or preference for professional workers, technicians, proprietors, managers, and sales people. In no case was an urban background preferred. A small number indicated "no preference" relative to background experience.

The study revealed that 53.1 percent of the agricultural workers could be acceptably replaced with persons with a high school diploma, 32.1 percent with post-high school education of less than baccalaureate degree, 10.3 percent with a college degree, and 4.4 percent with a master's degree.

3330. LASAP, SOTERO L., JR. Relationship of Selected Pre-college Experiences to Success in Teaching Vocational Agriculture. Thesis, M.S., 1964, University of Maryland. 95 p. Library, University of Maryland, College Park.

Purpose.--To determine the relationship of success in teaching vocational agriculture to teachers' pre-college background in farming, supervised farming programs, Future Farmers of America, and farm mechanics.

Method.--Teachers' pre-college experiences were secured through a questionnaire mailed to a stratified random sampling of vocational agriculture teachers who graduated from college in the United States in 1959 and 1960 and who were teaching vocational agriculture in early 1964. Teaching success was determined by ratings of teachers' performance by their principals, obtained in a companion study. Of the sample of 173 teachers, 75 percent returned questionnaires. Correlation was used to describe relationships.

Findings.--(1) There was no significant relationship between any of the selected variables constituting pre-college general farming background and success in teaching vocational agriculture, (2) of the pre-college experiences in supervised farming programs, only the teachers' self-rating of their experiences in selected farm jobs showed significant relationships with success in teaching vocational agriculture, (3) there was no significant relationship between pre-college Future Farmers of America experiences and success in teaching vocational agriculture, and (4) there was no significant relationship between index of teachers' self-ratings of experiences in selected farm mechanics jobs and success in teaching vocational agriculture.

3331. LAW, CHARLES JAMES, JR. Relationship of Position and Tenure to Role Expectations for District Supervisors. Thesis, M.Ed.,

1964, North Carolina State University. 87 p. Library, North
Carolina State University.

Purpose.--To determine the relationship of role expectations between teachers and administrators and between teachers with long tenure compared with teachers whose tenure was shorter. The role expectations concerned the most proper role for the district supervisor of vocational agriculture in 21 situations involving educational decisions.

Method.--A 76.5 percent response was obtained for the questionnaires mailed to superintendents, principals, and teachers. Data were analyzed to test the following hypotheses: (1) There are relationships in role expectations of the district supervisor of vocational agriculture between those held by vocational agriculture teachers and those held by administrators. (2) There are relationships in role expectations of the district supervisor of vocational agriculture between those held by teachers whose tenure is relatively long as compared to those held by teachers whose tenure is short.

Findings.--The first hypothesis was rejected in 12 educational areas and accepted in 9 educational areas. The second hypothesis was rejected in 20 of the educational areas and accepted in only 1 area. When the responses were grouped quantitatively, there were relationships in role expectations of the supervisor between those held by the teachers and those held by the administrators in nine situations. These situations occurred when there was a question regarding control of the time of a local teacher.

A relationship in response based upon length of tenure existed in only one situation; therefore, tenure was not related to role expectations of the district supervisor held by the vocational agriculture teachers.

The following implications were drawn from the study: (1) The most productive role for a district supervisor to play is one of a democratic nature; (2) Inspectional enforcement of rules and regulations concerning programs should be the responsibility of the local administration; (3) The role of the district supervisor will continue to move in the direction of democratic orientation even in areas of program administration; (4) Supervisors should avail themselves of every opportunity to obtain further education along the lines of democratic supervison; (5) The supervisor should make a definite attempt to determine what the administrators, principals, and teachers in his district view his role to be; and (6) The supervisor should attempt to resolve such conflicts as arise so that he may be better able to perform his job.

3332. LEIMBACH, GALE J. A Study of Vocational Agriculture for Students from Urban Homes. Thesis, M.A., 1964, The Ohio State University. 105 p. Library, The Ohio State University, Columbus.

Purpose.--To investigate the effects of the urban population upon the vocational agriculture enrollment and to determine the trends of urban enrollment in vocational agriculture, some of the characteristics of those students, and some of the educational values from vocational agriculture that former students from urban homes were finding helpful in their present occupations.

Method.--Questionnaires were mailed to 170 teachers of agriculture in Ohio who had taught in the same school system from 1958 to 1963. A total of 105 questionnaires or 61.7 percent were returned. These teachers supplied names and addresses of students who came from urban homes and had left their departments during the school years 1958-59 and 1959-60. One hundred questionnaires were mailed to these students. A total of 51 were returned.

Findings.--(1) Students from urban homes made up one in four of the total vocational agriculture enrollment among the selected departments in Ohio during 1963-64 and during each of the preceding years. (2) The number of students enrolled in high school and vocational agriculture increased approximately 20 percent during the period from 1961 to 1964 with an increase each year. (3) One in four of all the students of vocational agriculture from 1961 to 1964 discontinued the course. Of these, 43.7 percent were urban students compared to 62.3 percent for farm students. (4) The most important reasons given for boys discontinuing vocational agriculture were: quitting school, changed curriculum, or moved. (5) Forty-six percent of the former urban students were engaged in farming, attending agriculture college or employed in an occupation related to agriculture in 1964 whereas only 40 percent reported the same occupation immediately after graduation. (6) Vocational agriculture was most helpful to the students in their present occupations in terms of handling the skills of their jobs, in providing leadership experience, in learning about job opportunities in agriculture, and in making managerial decisions. (7) Approximately three-fourths of the teachers reported they had made changes in the curriculum for farm mechanics and crop production including horticulture because of urban students. Three-fourths also indicated more changes would be made in farm mechanics.

3333. LINSON, MARVIN G. A Guide for Self-Evaluation of State Supervisory Programs in Vocational Education in Agriculture. Dissertation, Ph.D., 1964, The Ohio State University. 203 p. Library, The Ohio State University, Columbus.

Purpose.--(1) To develop a guide for the self-evaluation of State supervisory programs of vocational education in agriculture as a basis for program development and improvement. (2) To design an instrument to assist State supervisors in the self-evaluation of their supervisory programs of vocational education in agriculture.

Method.--In developing the self-evaluation instrument, a set of statements was developed which were designed to be "indicators" of successful implementation of guiding principles of State supervison of vocational education in agriculture. Two national juries of experts in educational supervision assisted in refining the indicators and evaluating their importance to the effective implementation of the guiding principles. A set of procedures was developed for using the self-evaluation instrument. The instrument and suggested procedures were used by the State supervisory staffs in five states to evaluate their state supervisory programs.

Findings.--Responses from the trial States indicated that the instrument was helpful in bringing about changes in the supervisory programs. It was concluded: (1) that the self-evaluation instrument had procedures developed by this study which may appropriately be used by other State supervisory staffs of vocational education in agriculture as a device for assessing their supervisory programs, (2) that the use of the instrument and procedures for the self-evaluation of State supervisory programs was an effective means of bringing about change in State supervisory programs of vocational education in agriculture, and (3) that the 121 indicators listed in the self-evaluation instrument identified the major activities of an effective State supervisory program of vocational education in agriculture.

3334. LOCKWOOD, LARRY LEE. Competencies Needed by Males Engaged in Dairy Farming. Thesis, M.S., 1964, Iowa State University of Science and Technology. 97 p. Library, Iowa State University of Science and Technology, Ames.

Purpose.--(1) To determine the competencies needed by men successfully engaged in dairy farming, (2) to determine the relation of selected factors to the evaluation of the degree of competence needed and possessed by a selected sample of Dairy Herd Improvement Association and Owner Sampler dairymen in Iowa, and (3) to plan for educational needs of future replacement dairy farmers.

Method.--A panel of 16 selected dairymen and Iowa State University of Science and Technology staff members identified the competencies needed by males engaged in dairy farming. A questionnaire based on the competencies needed was given to a random sample of 130 DHIA and a sample of 130 Owner Sampler dairymen in Iowa. They were instructed to evaluate (1) the degree of competence they needed to succeed and (2) the degree of competence they presently possessed. Responses (70 percent) indicating degree of competence needed and possessed were analyzed using mean scores.

Findings.--Of the 46 competencies listed by the panel, 11 were understandings and 35 were abilities. Highest overall scores for degree of competence needed by both groups were found for the understandings of dairy product standards set by law and by the local milk market, methods of maintaining high sanitation standards and the use of chemicals in this operation, and for the ability to feed cows a balanced ration based on maintenance and production needs, to make efficient use of high quality roughage, to select desirable production and breeding stock, and to follow a constructive breeding program. Respondents felt they possessed significantly less competency than they needed in all of the 46 competencies.

Comparisons among groups showed the following relationships between total scores for competence needed and possessed: (1) younger dairymen had wider differences than older dairymen, (2) dairymen with fewer years of experience had wider differences than those with more experience, (3) DHIA dairymen had wider differences for men with less formal education, whereas owner sampler dairymen had wider differences for those with more formal education, and (4) increased years of vocational agriculture tended to widen the difference.

Relationships between selected control variables and degree competence needed and possessed scores in 10 selected competencies were studied using correlation analysis. Highest correlation coefficients were found between the ability needed to make efficient use of high quality roughage and (1) the ability needed to feed cows a balanced ration based on maintenance and production needs (.75) and (2) the ability needed to determine amount and kind of concentrate to feed, considering dairy product prices and input costs (.58).

3335. LOVE, GENE M. and STEVENS, GLENN Z. Educational Effectiveness of Three Sequences of Scheduling Classes and of Three Patterns of Supervision and Instruction in an Inservice Education Course for Teachers. Staff Study, 1964, The Pennsylvania State University. 18 p. Department of Agricultural Education, The Pennsylvania State University, University Park.

Purpose.--To compare the educational effectiveness of (1) three sequences of scheduling classes and (2) three patterns of supervision and instruction in inservice teacher education classes.

Method.--Classes were scheduled as three-day workshops, weekly sessions and monthly sessions. Each sequence of scheduling was employed according to the following three patterns of supervision and instruction: (1) Qualified Teacher, (2) Educational Specialist and (3) Technical Specialists. The order in which each of the three scheduling sequences was used with each of the three patterns of supervision and instruction was regulated by a modified Latin square design to control its effect on the two major treatment variables. Class instruction was limited to 15 hours. The qualified teacher and educational specialist were given intensive training to prepare them to teach a unit on quality milk production. Four technical specialists, selected for their technical knowledge, were assigned to teach the six problem areas in the unit on quality milk production.

Teachers who studied quality milk production in the classes taught by the qualified teacher and the educational specialist were given a teacher's plan for the course and provided selected resource materials. Each technical specialist was allowed to select his own method of teaching the problem areas assigned to him. Educational effectiveness was measured in terms of knowledge learned on a 60-question multiple choice test. Data were analyzed by analysis of covariance. Covariates used were (1) pre-test scores and (2) attendance. Level for significance was set at .05.

Findings.--The workshop was found to be a significantly better method of scheduling classes than the monthly sequence. No differences were observed between the workshop and weekly sequences. Both the qualified teacher and the educational specialist patterns of supervision and instruction were significantly superior choices.

The mean adjusted test scores (adjusted for attendance and pre-test score) for teachers in each treatment group were as follows for sequences of scheduling classes: Workshop - 49.8, Weekly - 48.1, and Monthly - 47.6. The mean adjusted test scores for patterns of supervision and instruction were as follows: Qualified Teacher - 50.4, Educational Specialist - 49.8, and Technical Specialists - 45.3.

Three-day workshops taught either by a qualified teacher or by an educational specialist resulted in the greatest amount of subject matter learning by teachers enrolled. The traditional practice of using several technical specialists as instructors to teach off-campus inservice courses for teachers was not equally effective. The competence of faculty members used as technical specialists is not questioned. The administrative procedure of scheduling one or two class sessions to be taught by each instructor resulted in lowered achievement.

3336. LUSTER, GEORGE LOWELL. A Teacher Evaluation of Selected Teaching Materials for Programs of Vocational Agriculture in Kentucky. Staff Study, 1965, University of Kentucky. 13 p. Department of Agricultural Education, University of Kentucky, Lexington.

Purpose.--To have teachers of agriculture in Kentucky evaluate selected teaching materials (1) to determine the use of 58 prepared high-school teaching units, (2) to secure an evaluation of each unit, (3) to have the major divisions in the teaching-unit format evaluated, (4) to determine the usefulness of calendars and lists of improved practices, colored slides, and teaching-materials newsletters, (5) to determine the equipment that teachers had for using selected materials, and (6) to get their suggestions for improving teaching materials.

Method.--A 5-page survey was mailed to the 265 high school teachers of agriculture. The survey contained an open-end question asking for suggestions to improve the teaching-materials program. Each teacher was expected to complete the survey, but in several cases two or more teachers in a single department completed one survey for the department.

Thus, the 155 surveys returned represented the views of more than 155 teachers. The surveys were not coded, and teachers were not asked to sign them.

Findings.--Of the 58 teaching units 19 were used by more than two-thirds of the teachers, and 46 were used by more than one-third of the teachers. Over half the teachers in Kentucky teach in multiple-teacher situations. Therefore, they can use only the units appropriate to the grade level which they teach.

The sections of units dealing with content received the highest rating. These included content or subject material, supplementary information to support content (tables, charts, drawings, etc.), major teaching objective and minor teaching objectives, and the references. The suggestions on techniques of teaching (introduction of the unit, class instruction, and evaluation) rated lower. Teachers felt that calendars and lists of improved practices, colored slides, and teaching-materials newsletters were helpful and that these materials should continue to be provided. Generally, over 80 percent indicated that these items were useful. Most of the teachers had the necessary equipment to use available instructional media. About half had overhead projectors, and about a third had access to a copier to prepare transparencies. Most teachers were using the teaching equipment they had.

3337. MABE, DAN E. Factors Influencing the Development of Productive Enterprises of Students of Vocational Agriculture in Idaho. Thesis, M.Ed., 1964, Colorado State University. 123 p. Library, Colorado State University, Fort Collins.

Purpose.--To determine what factors influence the development of productive enterprises of students of vocational agriculture.

Method.--Data for this study were gathered by questionnaires from 59 randomly selected third-year vocational agriculture students and 31 instructors.

Findings.--Sixty-nine percent of the students had a fair to good chance of becoming established in farming. They carried an average of 2.6 productive enterprises with an inventoried value of $596 per student.

The factors in five situational categories were rated by the respondents according to the degree of satisfaction found for the development of productive enterprises. The highest scoring factors on the basis of total weighted scores follow. (1) Factors involving the "student situation" were: freedom from time spent on 4-H work, health, interest in agriculture, ability to maintain accurate records, attitude toward productive enterprises, industriousness, student-financed initial enterprises, and ability of student to assume responsibility. (2) Factors involving the "home farm situation" were: extent of doing own work on productive enterprises and ease of access to electricity for productive enterprises. (3) Factors involving the "school situation" were: competition with other FFA members, freedom from athletics to develop productive enterprises, cooperation of principal and teachers, and desire for FFA degree advancement. (4) Factors involving the "parental situation" were: cooperation with agriculture teacher, interest in son's education, degree of student ownership of projects, and parents favored reinvestment of profits in productive enterprises. (5) Factors relative to the "teacher situation" were: personal interest of agriculture teacher in productive enterprises, adequacy of class instruction for application to your productive enterprises, extent of parent-teacher-student conferences, and adequacy of individual instruction for success of your productive enterprises.

3338. MABON, ELWOOD JACKSON. Competencies in Agriculture Needed by Males Employed in Country Elevator Grain Marketing. Thesis, M.S., 1964, Iowa State University of Science and Technology. 160 p. Library, Iowa State University of Science and Technology, Ames.

Purpose.--To determine: (1) the important agricultural competencies needed by males employed in country elevator grain marketing, (2) the degree each agricultural competency was needed and possessed, (3) factors that influenced the degree personnel needed and possessed each agricultural competency, (4) the important non-agricultural competencies and the degree each was needed, and (5) the employment opportunities in the industry in Iowa.

Method.--This was a statewide three-phase study. Sixteen country elevator managers in well-managed businesses were selected as a panel of specialists by the Iowa grain trade associations to aid in identifying the important agricultural and non-agricultural competencies needed by grain personnel. Phase 1: Questionnaires were mailed to 310 persons in 155 well-managed elevators. Personnel in 143 elevators (92 percent) returned questionnaires. A total of 264 questionnaires were used from 132 elevators having both a manager and an employee who returned questionnaires. Product moment correlation matrices were developed including 52 variables. Phase 2: The degree managers and employees needed non-agricultural competencies was evaluated by the panel. Phase 3: Employment data questionnaires were mailed to a random sample of 272 managers representing one-fourth of an up-to-date list of 1,088 country elevator managers. Approximately 89 percent of them responded.

Findings.--The panel identified 37 agricultural competencies which the 264 managers and employees confirmed to be important and needed by grain business personnel. Highest overall mean scores for all employees were found for the abilities (1) to identify various types of grain, (2) to sample, weigh, and grade grain, (3) to figure and receive grain bids, (4) to analyze a farmer's credit potential and to know whether to extend credit, and (5) to understand moisture migration and its effects on grain and grain marketing procedures.

In general, the higher the level of job classification the greater the degree of importance of the competencies according to the managers' evaluations for all three job categories and the self-evaluations by the employees. Respondents consistently indicated a need for greater competency than they possessed. Of the persons studied 73 percent had had some farm experience. Comparisons indicated that the group with no farm experience needed more, but possessed less, competence than the groups with farm experience.

3339. McCLAY, DAVID R. A Comparison of Programed and Lecture-Discussion Methods of Teaching Farm Credit to High School Youth and Adults. Staff Study, 1964, The Pennsylvania State University. 42 p. Department of Agricultural Education, The Pennsylvania State University, University Park. 0

Purpose.--To determine the effectiveness of programed instruction compared with lecture-discussion as a method of teaching farm credit to three grade levels of vocational agriculture students in high school.

Method.--A resource booklet and teaching unit were developed for the students and teachers, respectively, involved in the lecture-discussion method of teaching. A programed booklet requiring overt responses was developed for the other group of students. The multivariate design involved 480 students in 20 schools in 1961-62 and 128 students in 8 schools in 1962-63, in Pennsylvania, Delaware, Maryland, Virginia, and West Virginia, where complete programs of vocational agriculture were offered. The major variables were teaching method, grade level, and answer sheet. Individual differences among students in 1961-62 were controlled by a standardized test on reading ability and by a pretest on knowledge of farm credit. The following year an involvement index was substituted for the test of reading ability.

Findings.--The lecture-discussion method of teaching farm credit was found to be significantly better than programed instruction in the 1961-62 phase of the experiment. Some lecture-discussion students used twice as much time as did the programed instruction students. When the amount of time was controlled during the 1962-63 phase of the study, there was no significant difference between the mean scores for each method, although the higher scores for lecture-discussion continued.

Generally speaking, the higher the grade level and age of the students the greater the pretest, test, and retest scores. The same relationship was evident in the reading comprehension scores and the involvement index scores. Students in each grade level increased their knowledge of farm credit from the pretest to the test. The differences due to grade level were significant in both years of the experiment. Use of the feed-back answer sheet resulted in higher retest scores, statistically significant in the first phase only.

In the second phase of the study in 1962-63 the teachers answered a questionnaire that asked for their opinions about programed instruction. They felt that it should be integrated with other methods of teaching, that while stimulating thinking it results in fewer questions being asked than in the lecture-discussion method, and that good students tend to derive more benefit from it than students of lesser ability.

3340. McCOMAS, J. D. and OTHERS. Inside the Hatch Valley--A Study of a Rural New Mexico Community. Staff Study, 1964, New Mexico State University. 60 p. Department of Agricultural and Extension Education, New Mexico State University, University Park.

Purpose.--To determine the community organizational structure and to identify attitudes toward schools, churches, business, agriculture, civic organizations, and pertinent problems perceived by the community.

Method.--Personal interviews were conducted with a stratified sample of 101 persons in the school district. Six additional persons within the sample declined to be interviewed.

Findings.--Of the 19 churches that served the community, 17 served a total membership of 1,000. Consolidation of churches of the same denomination or federation did not seem to be feasible at the time of the study. Church lay leaders were clearly identified in all but one of the major churches.

Respondents indicated a high level of satisfaction with the public schools. The absence of a parents' organization seemed to present a problem of communication. Less than six percent of the respondents indicated a strong dissatisfaction with the schools. The vocational agriculture program was considered to be a strong aspect of the school curriculum.

Respondents showed a lack of information concerning civic clubs and their activities. More than one-half of the respondents felt that there was no organization which was influential in community action.

Of the respondents 20 percent were able to name the county agent while 50 percent were able to name the teacher of vocational agriculture. Farmers had difficulty in identifying new practices they had adopted within recent years, and they were generally unaware of the factors that influenced their adoption of practices. Farm families subscribed to more magazines and newspapers than did non-farm families.

Goods and services other than clothing and furniture were usually purchased locally. A majority of the respondents believed that business was declining at the local stores. Recreational opportunities for community youth constituted a critical problem. Public school teachers were not expected to participate in church or community activities except as they might wish to participate.

3341. McCONNEL, AUSTIN, JR. A Determination of the Specialized Tools and Equipment Used and Needed for Teaching Farm Mechanics in Texas. Thesis, M.S., 1964, Texas A & M University. 43 p. Agricultural Education Library, Texas A & M University, College Station.

Purpose.--To determine (1) the availability, use, and need for various tools in the farm mechanics program of vocational agriculture in Texas, (2) the subject matter areas that are being taught, and (3) the amount of time that is being spent in each area by years.

Method.--Data were collected by questionnaires mailed to 200 randomly selected teachers of vocational agriculture. Teachers were asked to provide information about (1) the number of days spent on ten subject matter areas by years, (2) the tools they needed, (3) the tools they had, and (4) the extent to which tools were used.

Findings.--There were no significant differences in the subject matter being taught in the farm mechanics program among the different geographical areas of the state. This study also revealed that some tools purchased for use in farm mechanics programs are not used enough for instructional purposes to justify their cost. Evidently, specialized tools and equipment limit the scope of many farm mechanics programs.

Based on the data from this study, the average number of days spent on farm mechanics in Texas is as follows: Vocational Agriculture One, 48 days; Vocational Agriculture Two, 61 days; and Vocational Agriculture Three, 70 days.

3342. McCORMICK, FLOYD G. The Development of an Instrument for Measuring the Understanding of Profit-maximizing Principles. Dissertation, Ph.D., 1964, The Ohio State University. 225 p. Library, The Ohio State University, Columbus.

Purpose.--To develop an instrument for measuring the understanding of basic profit-maximizing principles essential for efficient operation and management of a farm business with implications for vocational education in agriculture.

Method.--Basic profit-maximizing principles were identified from farm management references selected by the farm management staff at The Ohio State University. The results of 3 pretests were utilized in refining 45 multiple-choice questions contained in the final evaluative instrument.

Year-end business analysis data from 158 farm ownership borrowers of the Farmers Home Administration in Ohio were used to determine discriminate groups of farm managers. Input-output, cost of production, and growth of business indexes were computed for each farm operator. Final identification of a farm operator's relative level of managerial competence was based on the aggregate rank order synthesized from individual index ranks.

Statistically, the Mann-Whitney U-test was used to identify multiple-choice questions discriminating between level of managerial competence and understanding of profit-maximizing principles. The F test was used to test the significance of differences between selected economic factors and personal characteristics of the population and relative levels of managerial ability.

Findings.--Seven basic profit-maximizing principles contributing to efficient farm organization and planning were identified as (1) diminishing physical returns, (2) diminishing economic returns, (3) fixed-variable costs, (4) substitution, (5) equi-marginal returns, (6) combinations of enterprises, and (7) time relationship.

Nineteen of the forty-five multiple-choice questions possessed positive significant relationships between levels of managerial competence and understanding of economic principles. The evaluative instrument developed for the study provided increased insight for measuring the understanding of six profit-maximizing principles.

The analysis of variance revealed no significant difference between achievement on the evaluative instrument and level of managerial competence. Only 59.9 percent of the questions were answered correctly by the farm managers which indicated that a large percentage of the farmers did not possess a comprehensive understanding of profit-maximizing principles as measured by the evaluative instrument. Older farm operators possessed less understanding of basic principles than did younger farm managers.

There was a direct correlation between the understanding of principles and the years of formal schooling completed. There was no significant relationship between relative level of understanding of profit-maximizing principles and the application of these principles in the farm business.

Size of operation, gross farm income, net farm income, and increase in net worth were four of the ten selected economic and personal factors which differed significantly between relative levels of managerial ability. Net farm income and gross farm income were the most significant indicators of an individual farm manager's economic efficiency. The "cost of production" ratio was the most discrete economic index for predicting the relative level of managerial competence.

3343. McGEE, IVAN C. The Identification and Analysis of Agricultural Occupations in Seventeen Pennsylvania Counties. Thesis, D.Ed., 1965, The Pennsylvania State University. 148 p. Library, The Pennsylvania State University, University Park.

Purpose.--(1) To estimate the present number of employees needing agricultural competencies by occupational family, level of employment, and job title, (2) to estimate the number of employees needed and the annual number of entry opportunities five years from now, (3) to determine job characteristics, and (4) to cluster competencies and job titles in the farm machinery family.

Method.--A list of 2,142 businesses and services with employees needing agricultural competencies was compiled for 17 counties in Pennsylvania. A random sample of businesses and services was taken. The employers were interviewed and employment data were collected. Data were tabulated and reported by occupational family, level of employment, and job title. Job titles and job competencies in the farm machinery family were factored using factor analysis with varimax rotation.

Findings.--There were 9,221 full-time and 3,316 part-time employees in the 2,142 businesses and services surveyed in the 17 Pennsylvania counties. An increase of 1,498 employees is expected in the next five years, and an additional 3,765 persons are expected to be hired as a result of anticipated employee turnover. Nearly 60 percent of the present employees were in the skilled and semi-skilled levels of employment. Approximately 79 percent of the employees to be hired in the next five years are expected to be in the skilled and semi-skilled occupational levels.

There were 271 job titles identified in the study. Employees in 37 of the job titles represented 54 percent of the total number of persons employed full-time. A high school education was desired for beginning employment in 90 percent of the job titles. Employers preferred to employ persons with a farm or rural background in 72 percent of the job titles.

The competency factors produced when the job titles were factored indicated that competency areas could be formulated and could serve as a basis for the development of programs for the education of persons planning to be employed in farm machinery occupations.

3344. McMULLEN, JAMES R. A Comparison of Methods of Instruction Used in Teaching Agricultural Information to Vocational Agriculture Students. Thesis, M.Ed., 1965, The Pennsylvania State University. 78 p. Library, The Pennsylvania State University, University Park.

Purpose.--To measure the effectiveness of two methods of teaching selected areas in farm forestry and dairy products. One group received instruction from their own vocational agriculture teacher and the other group received their instruction from subject matter team teaching specialists.

Method.--Ninth grade classes of students in vocational agriculture departments in high schools in Indiana County, Pennsylvania, were selected. Two of the schools used a subject matter team procedure to teach selected areas of farm forestry and dairy products. One instructor, a specialist in farm forestry, taught the forestry unit in his own school and taught the same unit in another school. At the time of the exchange of teachers, the second instructor taught the dairy products unit in the first school. The other schools used the teacher's own method of teaching the same areas of farm forestry and dairy products. At the completion of sixteen class hours of instructional time, tests on farm forestry and dairy products were administered. Individual differences of students were controlled by covariance analysis using scores from the sixth grade California Test of Mental Maturity. Final test scores were the criterion measure.

Findings.--There was a significant difference in the test scores between the two methods of teaching selected areas of farm forestry and dairy products. Ninth grade vocational agriculture student achievement was greater for those students taught by the subject matter team teaching specialist method. A team teaching evaluation form was completed by the students in the instruction phase of the study. Ninth grade vocational agriculture students indicated a strong desire for more team teaching in vocational agriculture.

It was recommended that further research be conducted on more comprehensive team teaching in other areas of agriculture. Instructors in multiple teacher departments might profitably use a variety of team teaching procedures, some of which could include instructors in other departments of the high school.

3345. MITSCHELE, WALTER. Competencies in Animal Science Needed by Vocational Agriculture Instructors. Thesis, M.S., Iowa State University of Science and Technology. 100 p. Library, Iowa State University of Science and Technology, Ames.

Purpose.--To determine competencies in animal science needed by vocational agriculture instructors, degree of competence possessed by the instructors, and place of acquiring competencies.

Method.--A list of competencies was developed by a panel of outstanding vocational agriculture instructors and revised by a panel of College of Agriculture specialists. The revised list was mailed in questionnaire form to 225 experienced Iowa vocational agriculture instructors. Instructors indicated the degree each of the competencies were needed and possessed on a 10 point scale and whether the competence was acquired on farm, in vocational agriculture, in college, or on the job. Instructors were stratified into Groups A, B, C, or D according to teaching competency.

Findings.--The ability to balance and plan rations and the principles of nutrition were evaluated as the two most needed competencies by Group "A." The same competencies in reverse order were also rated as the most needed by Group "D." Rated lowest on the scale was the ability to shear sheep. In 21 of the 25 competencies listed, the instructors in Group "A" indicated a need for more competence than they possessed. The largest indicated need differences were for use of records in livestock selection and State health regulations and sanitation practices with mean score differences of 1.1 and 1.0 respectively.

The Spearman rank order coefficient of correlation was used to analyze the mean competency needed scores. A correlation of .91 was obtained for Group "A" and Group "D" indicating a strong tendency to rate the animal science competencies needed similarly. Correlations were run to determine the extent to which changes in the ratings of one needed competency studied were accompanied by equal changes in another needed competency. Of the 325 combinations possible, 183 were significantly correlated at the one percent level, 61 at the five percent level, and 81 were not significantly correlated for Group "A."

The instructors indicated that 15.3 percent of the competencies had been acquired on the farm, 10.3 percent in vocational agriculture, 46.1 percent in college, and 28.3 percent on the job. Competencies involving understanding were more often learned in college while abilities were usually more often learned on the farm or on the job. The findings of this study indicated that while some competencies were given much higher needed scores than others, all 25 of the animal science competencies listed were needed to some extent by vocational agriculture instructors.

3346. MORRISON, RICHARD G. Development and Application of Techniques and Procedures for Determining Training Needs and Occupational Opportunities for Students of Vocational Agriculture Within the Baton Rouge Agri-Business Complex. Dissertation, Ph.D., 1964, Louisiana State University. 434 p. Library, Louisiana State University, Baton Rouge.

Purpose.--To develop techniques and procedures for surveys to determine non-farm agricultural opportunities, and to apply these techniques and procedures in the Baton Rouge metropolitan area.

Method.--Data were secured by personal interview from 152 farm-based businesses in the Baton Rouge area. The study was concerned with all farm-based businesses in the area.

Findings.--There are 7 major occupational families in the Baton Rouge agri-business complex. There are 2,811 employees categorized into 9 levels of employment, and 225 titles with an average of 12 people in each job title. Employees in most agricultural job titles need training in one or more phases of agriculture, namely, agricultural business management and marketing, agricultural mechanics and automation, animal science, and plant science. A farm background is a desirable prerequisite for most job titles and a necessity for several employees. The average age of the Baton Rouge agri-business personnel is between 30 and 40. The average monthly salary is approximately $600 to $700 for professional, technical, managerial, and supervisory employees, and between $200 to $400 for clerical, sales, skilled, and semi-skilled workers. A high school education is required for employees in Baton Rouge agri-businesses with the exception of a few semi-skilled and unskilled workers. College degrees are desirable for several employees, particularly those in managerial, professional, technical, and clerical job titles. Most employees must pursue on-the-job training to advance within their job titles. Respondents often indicated that many of their employees attend in-service industry short courses or pursue advanced degrees in an agricultural college to advance to another level of employment.

3347. MYERS, DAVID W. Present Occupational Status of Individuals Who Qualified to Teach Vocational Agriculture from Washington State University 1942-1961. Thesis, M.S., 1964, Washington State University. 33 p. Holland Library, Washington State University, Pullman.

Purpose.--To ascertain the occupational status of persons who qualified to teach vocational agriculture at Washington State University between 1942 and 1961 and to identify the causes of losses of graduates to other areas of employment.

Method.--Questionnaires were sent to 79 graduates still teaching vocational agriculture in the State of Washington and to 123 graduates who entered other occupations. Replies were received from 63.6 percent of the graduates.

Findings.--Those employed as vocational agriculture teachers in the State of Washington comprised 35.1 percent of all qualifying. Nearly 78 percent had taught at least one year. The largest losses of graduates were to other teaching areas and to school administration (54.7 percent); to occupations related to agriculture (12 percent); and to farming (9.3 percent).

3348. NARANJO, GARARDO E. The Graduate Program of the Inter-American Institute of Agricultural Sciences: An Evaluation of Certain

Aspects Through a Follow-up of Graduates. Thesis, Ph.D., 1965, Michigan State University. 203 p. Library, Michigan State University, East Lansing.

Purpose.--To make a follow-up study of the graduates of the Tropical Center for Teaching and Research of the Inter-American Institute of Agricultural Sciences of the Organization of American States during the past 19 years in order to measure the accomplishments of the institution in the field of graduate training. The specific objectives of the research were: (1) to survey experiences of the graduates from the graduate school and their opinions regarding the value and achievement of the school's educational objectives, academic program, and related aspects and (2) to study relationships between the graduate's department of study at the school with his job after graduation, job satisfaction, and job expectancy as well as to register the graduate's urgent problems.

Method.--(1) Data were derived from interviews and questionnaires returned by 128 IICA graduates out of a total of 157 persons who received the instrument and who graduated from that institution. Appropriate tests of validity and reliability were applied to the instrument. (2) The collected information was grouped in a total of 153 variables dealing with the different areas mentioned in the objectives above. (3) In the statistical treatment of data, chi square was selected as the statistical tool to test the significance of collected information and the possible degree of relationship between the graduate's opinions and his department of study.

Findings.--(1) High value was awarded by the graduates to the Tropical Center of Graduate Teaching and Research, as a graduate educational institution serving the Latin American country members of the OAS. Of the total 128 respondents 112 declared a highly favorable attitude toward the IICA graduate school. (2) The graduates awarded the highest value to all the educational objectives set by the graduate school and they recognized that the Institute has met those objectives in an appropriate way. (3) The strengths of the institution as mentioned by respondents were: "an ideal combination of teaching and research," "very good library facilities," "faculty with Ph.D.'s and scholarship," and "very good environment, facilities, and scientific attitude to carry on research and teaching in tropical agriculture, agricultural extension, and animal husbandry." Of the 128 graduates who responded, 114 recognized a very high level of academic competence in the faculty which forms the center. (4) Most of the graduates following doctoral studies in American universities had received recognition for their "Magister" degree granted by the IICA, and 24 out of 28 pursuing such studies recognized that the training was of great value to them in their process of doctoral education. (5) The graduates recommended the suitability of establishing a placement bureau for graduates. (6) Job dissatisfaction as expressed among the IICA graduates was extremely low. Only 6 out of 128 respondents were dissatisfied with the specialization chosen. (7) The most favorite aspiration of 100 graduates was that of increasing their efficiency by way of expanding their knowledge, skills, abilities, and understandings.

3349. NOAKES, HAROLD L. A Survey of Student Interests in Five Agricultural Occupation Groups in Twelve New York School Districts. Staff Study, 1965, New York Education Department. 31 p. Bureau of Agricultural Education, New York Education Department, Albany.

Purpose.--(1) To provide data relative to student interests in agriculture, and (2) to supplement occupational data as a basis for planning area programs in agricultural education.

Method.--All students in grades 8, 9, and 10 in 12 New York school districts were requested to complete a questionnaire surveying their interests in agricultural activities and their preference for occupational families in agriculture. The 5 occupational areas were: (1) Agricultural Machinery and Mechanics; (2) Agricultural Sales and Service; (3) Farm Work, Operation, and Management; (4) Ornamental Horticulture, Landscaping, and Floriculture; and (5) Conservation, Forestry, and Campsite Activities. A total of 3,611 students or 93 percent of the students surveyed completed questionnaires.

Findings.--A large number of students were interested in enrolling in agricultural courses. Over 38 percent of the 3,611 students studied indicated an interest in one or more occupational groups in agriculture. Male students preferences for occupational groups were as follows: (1) Conservation, Forestry, and Campsite Activity; (2) Agricultural Machinery and Mechanics; (3) Farm Work, Operation, and Management; (4) Ornamental Horticulture, Landscaping, Floriculture; and (5) Agricultural Sales and Service. Female students preferences were: (1) Ornamental Horticulture, Landscaping, and Floriculture; (2) Conservation, Forestry, and Campsite Activity; (3) Farm Work, Operation, and Management; (4) Agricultural Sales and Service; and (5) Agricultural Machinery and Mechanics.

3350. NOOR, SHEIKH MOHAMMED ABDUM. Perceptions of the In-Service Education Needs for Secondary Teachers in East Pakistan. Thesis, Ph.D., 1965, Michigan State University. 251 p. Library, Michigan State University, East Lansing.

Purpose.--(1) To determine a set of criteria for in-service teacher education in East Pakistan. (2) To analyze the in-service education needs for secondary teachers in East Pakistan as conceived by various administrative and educational groups. (3) To determine a set of standards for salary increases or portions in East Pakistani schools. (4) To determine the role played by the East Pakistan Education Extension Centre--a primary agency for in-service education of teachers.

Method.--The basic data were collected personally during a 3-month field trip to East Pakistan from 222 secondary school teachers, 45 administrators, and 13 consultants, all directly or indirectly connected with the in-service education of teachers in East Pakistan. The process of collecting data was mostly accomplished with three survey instruments by means of tape-recorded personal depth interviews.

Findings.--The administrators rated their need and the need of the teachers for in-service education consistently higher than the teachers for most of the 226 need items. The differences between the administrators and teachers on the relative "degree of need" of different items were statistically insignificant in most cases. The consultant tended to have greater affinity with the administrators in their perception of these need items in which differences between teachers and administrators were considered statistically significant. The teachers expressed great need in the areas of library facilities and curriculum. The administrators expressed great need in the areas of curriculum and personality. Organized educational trips, intervisitation of schools, workshops, and faculty meetings directed to professional improvement were preferred in-service education activities. Insufficient financial grants and family responsibilities limited teacher participation in in-service education activities.

Training in teacher education colleges, seniority, and evidence of good teaching were the three major standards on which promotion or salary increases were reported to be determined in most East Pakistani schools. The East Pakistan Education Extension Centre has made educational progress and has enlarged its responsibilities in spite of many obstacles stemming from ideological conflicts, organizational rivalries, and competition. The differences in thought and perception between administrators and teachers were not significant enough to cause practical problems. Both administrators and teachers in East Pakistan were satisfied with their profession. However, this satisfaction could be advantageously maximized by means of further incentives, both monetary, and non-economic.

3351. O'KELLEY, G. L., JR. and LESTER, H. T., JR. A Comparison of the College Performance of Students Who Did and Those Who Did Not Study Vocational Agriculture in Georgia High Schools in Terms of Grades Earned During Freshman Year of Study at Abraham Baldwin Agricultural College During 1960-1961 School Year. Staff Study, 1963, The University of Georgia. 39 p. Department of Agricultural Education, The University of Georgia, Athens.

Purpose.--To determine if there were significant differences in the college performance of students who did and those who did not study vocational agriculture in Georgia high schools in terms of grades earned during the freshman year of study at Abraham Baldwin Agricultural

College during the 1960-1961 school year, as stratified by high school units of vocational agriculture.

Method.--The study population was limited to male members of the freshman class enrolled in the college during the 1960-1961 school year who completed three full quarters of study during the school year and who were graduates of Georgia high schools. The population was classified into two study groups on the basis of whether or not high school vocational agriculture units of credit were submitted for college admission. The vocational agriculture study group was further classified as to the number of vocational agriculture credits submitted. Earned freshman grades were determined for specific courses and a mean grade calculated for each student. Analysis of variance and chi square were the statistical measures used to test hypotheses regarding CEEB scores, both verbal and mathematics, mean grades, and courses completed by groups.

Findings.--(1) Members of the non-vocational agriculture group recorded significantly higher mean total CEEB scores than the vocational agriculture group. (2) Members of the non-vocational agriculture group recorded significantly higher CEEB mean verbal scores and higher, but not significantly higher, CEEB math scores. Their mean freshman grades were not significantly higher than the vocational agriculture group. (3) Differences in grades earned by the two study groups were not significantly different in (a) botany, (b) chemistry, (c) English 102, (d) composite of American History, economics and zoology, (e) all agriculture courses, and (f) a composite of all courses. (4) Differences in grades earned by the two study groups in (a) English 101, (b) composite of English 101 and English 102, and (c) mathematics were significant at .01 level and favored the non-vocational agriculture group. (5) When students reporting varying numbers of units of vocational agriculture were compared, no significant differences were noted except when students with three units were compared with students with four units, in which case a significant difference in mean grades favoring the four-year group was noted.

3352. OLCOTT, KENNETH WAYNE. Determining Electrical Training Needs for Men Who Install and Service Farm Materials Handling Equipment. Thesis, M.Ed., 1964, Cornell University. 74 p. Library, Cornell University, Ithaca.

Purpose.--(1) To determine jobs being done by men who install and service farm materials handling equipment, (2) to determine jobs for which equipment servicemen feel they would like to have additional training, (3) to determine new trends in using electricity for farm materials handling equipment, and (4) to provide a basis for revising the content of the course in farm electricity at the Cobleskill Agriculture and Technical Institute.

Method.--The names of 234 farm materials handling equipment servicemen were obtained from the farm service representatives of the electric power companies that serve New York State. Each equipment serviceman was mailed a questionnaire in which he was asked if he had performed each of 34 electrical jobs in his work in the previous 3 years and if he would like to receive additional training if he had the opportunity. The same list of jobs was sent to a selected panel of consultants who were asked to indicate if they felt each job was necessary, desirable, or not necessary in a training program for servicemen of farm materials handling equipment. Each consultant had received training in farm electricity and was working in a professional capacity in the field.

Findings.--Questionnaires were returned by 81 equipment servicemen and 5 consultants. Two jobs, performed by 50 percent or more of the equipment servicemen and considered necessary by 50 percent or more of the panel of consultants, were (1) to calculate voltage drop and observe its effect on the equipment being installed and (2) to calculate the capacity of air handling equipment and determine where to install it.

Twenty-two jobs were performed by 50 percent or more of the equipment servicemen and were considered necessary by 50 percent or more of the panel of consultants. Four jobs were performed by 50 percent of the equipment servicemen and were considered desirable by 50 percent of the panel of consultants. Six jobs were performed by less than 50 percent of the equipment servicemen and were considered necessary by less than 50 percent of the consultants.

Three jobs were considered to be new trends because the proportion of consultants considering the jobs to be necessary was 25 or more percentage points higher than the percentage of equipment servicemen who were performing the job. These new trends were: (1) determining the type and size of motor control devices, (2) calculating capacity of air handling equipment and determining where to install it, and (3) selecting and installing overload protection devices for motors.

It was determined that farm materials handling equipment servicemen are not highly interested in in-service training programs since additional training was desired by 50 percent or more of the respondents for only two jobs.

Course content for the course in farm electricity at the Agriculture and Technical Institute at Cobleskill, New York, was determined as a result of this study and the course outline for this course was revised.

3353. OLSEN, LEE E. A Study of Off-Farm Agricultural Occupations in North Davis, Morgan, and Weber Counties in Utah. Thesis, M.S., 1965, Utah State University. 72 p. Library, Utah State University, Logan.

Purpose.--To identify the off-farm agricultural jobs and employment opportunities in North Davis, Morgan, and Weber Counties. To identify present and emerging off-farm agricultural occupations. To determine the present and anticipated numbers of employees needed two to five years from now.

Method.—After meeting with heads of major companies, staff members of the Department of Agricultural Education, and members of the Employment Service Bureau, two forms of a questionnaire were developed. Questionnaires were completed during personal interviews with 121 employers who represented a variety of businesses. Included were flower nursery, forestry, game management, recreation parks, and ornamental horticulture businesses.

Findings.—The total work force for the area studied was 54,600 persons employed and 3,800 persons unemployed. Of the employed persons there were 3,538 in agricultural occupations. This represented only 6.5 percent of the total work force of the Ogden labor market. There were 1,522 part-time employees, most of whom worked in food canning plants or poultry processing plants. Among the 3,538 employed in off-farm agricultural occupations, there was an annual turnover of 1,090 persons per year. Employers estimated that within five years they would need an additional 436 workers.

3354. PARAKARN, SMARN. A Study of Academic Achievement of Foreign Students at Kansas State University. Thesis, M.S., 1964, Kansas State University. 98 p. Library, Kansas State University, Manhattan.

Purpose.—To determine the significance of certain factors which were believed to be related to the academic achievement of graduate and undergraduate foreign students at Kansas State University in the fall and spring semesters, 1963-64. The factors studied were: (1) English proficiency, (2) academic background, (3) number of credit hours carried each semester, (4) major subject field, (5) extracurricular participation, (6) employment during the educational process, (7) residence, (8) sex and marital status, (9) age, (10) type of sponsors and financial status, and (11) geographical area.

Method.—Questionnaires were sent to foreign students who were enrolled in classes at Kansas State University the spring semester 1964. Grade point averages, lists of students, and results of English proficiency tests were obtained from offices of Admissions and Records, Dean of Foreign Students, and the English Department, respectively.

Findings.—Foreign students who had high abilities in English proficiency and a good academic background achieved the greatest academic success. Those who carried fewer credit hours generally earned a better grade point average. However, there was no definite correlation between credit hours and academic success. This varied widely within each major subject field. Graduate students who participated in extracurricular activities and undergraduate students who were non-participants in extracurricular activities had high academic success. Unemployed students had greater academic success than employed students.

Graduates who lived in dormitories had a slightly higher grade point average than those who lived in private apartments. When students from the same country lived in apartments together they had less academic success than those who lived separately. Men students had greater academic success than women. Married graduate and undergraduate students had greater academic success. Privately supported students received a lower grade point average than other groups of students. Academic success of foreign students varied widely within each country. European students had the greatest academic success. There was no definite correlation between academic success and the age of students. English problems and subject difficulty had the greatest affect on the studies of foreign students.

3355. PATTON, WILLIAM P. Those Who Enroll for Vocational Agriculture in West Virginia--Considering Certain Scholastic Achievements and Some Background Factors. Thesis, M.S., 1965, West Virginia University. 95 p. Library, West Virginia University, Morgantown.

Purpose.--To determine differences between male West Virginia high school vocational agriculture students and male West Virginia non-vocational agriculture students in (1) mental ability, (2) general scholastic achievement, (3) specific scholastic subject areas, (4) participation in extra-curricular activities, (5) awards received, (6) farm background, (7) family size, and (8) residence population.

Method.--A questionnaire was sent to male graduating students in 92 West Virginia high schools offering vocational agriculture. Approximately 65 percent of the questionnaires were returned.

Findings.--Male, non-agricultural students had a slightly higher average intelligence quotient then did male agricultural students. The mean intelligence quotient for non-agricultural students was 101. The mean for agricultural students was 96.

A class-rank comparison showed an average of about 13 percent of the agricultural students and about 22 percent of the non-agricultural students in the upper quartile; 40 percent of the agricultural students scored in the lower quartile as compared to 24 percent of the non-agricultural pupils.

A scholastic comparison of the agricultural and non-agricultural students based on a 4-point system showed that the non-agricultural group was slightly higher in grade point average in English, biology, algebra and geometry, business math, and social studies. The average over-all difference in the five academic areas was .32 of a point.

The non-vocational agriculture students had a higher percentage of participation in extracurricular activities which amounted to an average of 41 percent. Of all the vocational agriculture students 77 percent were from the farm while about 25 percent of the non-vocational students were farm residents.

The average farm acreage where vocational agriculture students resided was consistently higher than the farm acreage where the non-agricultural students resided. The vocational agriculture student group had more brothers and more sisters than the non-vocational agriculture group.

Eighty-six percent of the vocational agriculture students resided on farms or in the open country as compared to thirty-nine percent of the non-agricultural boys. There were twice as many agricultural students from hamlets as non-agricultural students. Twenty-three percent of the non-agricultural students were village residents, while only about five percent of the agricultural students lived in villages.

3356. PEARCE, FRANK CHARLES. The Educational Needs of Beginning Farm Operators in Becoming Established in Farming in New York. Thesis, Ph.D., 1964, Cornell University. 352 p. Division of Agricultural Education, Cornell University, Ithaca.

Purpose.--To determine those situational and individual characteristics of beginning farm operators which influence their comprehension and competence in becoming established in farming.

Method.--Key informants in each county in the State were asked to provide a list of beginning farm operators. In this way, 2,260 farmers were identified. These farmers were listed according to State agricultural regions and then stratified according to the number of cows they milked. The proportion of farmers in each stratification was computed. Using this base proportion, the farmers were put into clusters, and the clusters were selected at random. An interview schedule was prepared based on previous research and the recommendations of departments in the College of Agriculture. The schedule was field tested, and the procedure to be used in interviewing was standardized. Schedules were edited following data collection, and the information coded for computer analysis. Data were analyzed using cross tabulations, correlation matrices, and regression equations.

Findings.--There is a need for programs of instruction in agriculture in order for beginning farm operators to achieve establishment in farming. These programs should vary because of the differences in educational needs among farmers. However, the educational needs of farmers can be predicted on the basis of certain characteristics. An analysis of reading habits is the best single criterion. Moreover, direct relationships are to be expected between the educational needs in terms of approved practices or farm business characteristics and the individual characteristics of the farmers.

Farmers did not follow the old "agricultural ladder" in becoming established in farming in New York. They worked for agricultural wages and then attained an ownership status; started as a partner, worked for wages and then attained a partnership; or used a combination of wages and salary from professional positions, partnership and/or ownership.

Specific educational needs, such as the need for assistance in increasing milk production, improving herd health, and analyzing milk production records, were found in dairy husbandry. Farm management was the most important single area of educational need in improving farm efficiency, cost control, analysis of the farm business, use of credit, and planning for the future. The greatest needs in farm mechanics were in electricity, planning and constructing farm buildings, and selecting and repairing farm machinery. Crop production needs centered around soil management, controlling insects and weeds, selection of fertilizer and seed, and effective use of soil resources.

Insight into the attitude and philosophy of the beginning farm operator may be obtained through his goal setting activities. Goals reported among farmers indicated that in the future, farmers will bring more feed to the cows, engage in more pregnancy testing, use pipeline milking and bulk tanks, purchase rather than raise grain, and increase mechanization and chemical weed control. The behavior of the farmer can be changed by technical assistance visits, but these visits should have a purpose and should be planned in order to be effective. The farmer who is achieving well in farming is searching for additional technical assistance. However, this assistance should allow for active participation on the part of the farmer.

3357. PERSONS, EDGAR A. Farm and Home Business Record Analysis by the Use of Automatic Data Processing Equipment. Thesis, M.A., 1965, University of Minnesota. 120 p. Agriculture Education Department, University of Minnesota, St. Paul.

Purpose.--To develop a system of summarizing farm and home business records kept in the Minnesota Farm Account Book by the use of high speed electronic equipment. The primary objectives were to speed the summary process, to improve the retrievability of record data, and to expand the usefulness of the farm record summary as a teaching tool in the adult farm management program.

Method.--A 4-page data collection instrument was devised which allowed for the recording of all data for the proposed record summary. The data sheets were designed to permit data to be recorded in the same order and in the same basic units as reported in the account book and two supplementary forms used in closing the yearly account.

A computer program was developed for each of the 16 tables of the analysis. Programs were developed to provide summary tables for each individual farm as well as tables of averages for groups of farms which exhibited high, low, or average earnings or efficiencies.

A sample of 10 farm records was drawn from the files of each of 5 area record analysis centers. The data were summarized electronically to provide the same type of record summary data previously prepared by the area analysis centers by manual calculation.

Findings.—Electronic summary of farm records can be done effectively, economically, and with great dispatch with the proper use of high speed electronic equipment. The use of such equipment not only can easily duplicate the results obtained by manual computation but can open new possibilities for obtaining useful information through the use of special record sorts. Refinement in the processes of computing record averages and indices makes the resulting summaries of greater value as teaching tools for adult farm management programs.

3358. PHIPPS, LLOYD J., and OTHERS. Technical Education in and for Rural Areas, Technicians, and Other Workers Who Need Technical Knowledge. Staff Study, 1964, University of Illinois. 74 p. Division of Agricultural Education, College of Education, University of Illinois, Urbana.

Purpose.—To determine the need for technical education for persons living in and serving rural areas and to develop curriculums for clusters of occupations found in and serving rural areas.

Method.—Persons in a two-stage, cluster sample of businesses drawn at random were interviewed. Data relating to need were projected to the population universe. A principal axis factor analysis with a varimax rotation was utilized to obtain clusters of activities and of knowledges. Factor scores for each job title identified were obtained for each factor identified.

Findings.—(1) Retailing and service functions were predominant among the businesses studied. (2) Many businesses in rural areas were multi-purpose and had several functions. (3) Technicians having a wide variety of technical abilities were employed in rural areas. (4) Technicians needing technical competence in the biological and soil sciences and in agricultural engineering were predominant among the technicians identified. (5) The need for technicians is increasing. (6) There is considerable need for additional technicians in rural areas. (7) Technicians and other workers needing some technical education who are employed in rural areas may be clustered into groups in terms of their activities and knowledge areas. Curriculums may be designed to meet the needs of clusters of workers needing technical education.

3359. PRITCHARD, JACK W. The Reading Proficiency of Vocational Agriculture Students as Compared to Classroom Performance and Future Farmer Activity Participation. Thesis, M.S., 1964, Oklahoma State University. 48 p. Agricultural Education Department, Oklahoma State University, Stillwater.

Purpose.--To determine the relationship between reading proficiency of students and their performance in the classroom and in Future Farmer of America activities.

Method.--The Nelson Denny reading test was given to 86 sophomore, junior, and senior vocational agriculture students from three high schools to determine if proficiency in reading is a factor in determining student participation in Future Farmer of America activities and classroom performance. Each instructor in the three schools completed a questionnaire rating each student in Future Farmer participation and in aspects of classroom performance.

Findings.--There was a definite relationship between a student's reading ability and participation in Future Farmer of America Chapter activities, and performance in the vocational agriculture classroom. The relationship of reading ability to chapter participation was not as high for the upper level readers as it was for the lower level readers. The relationship of reading ability to chapter participation was not as significant as it was in areas of a student's classroom performance. In all areas of classroom performance, the relationship of reading ability to performance was high.

3360. RICHARDSON, C. MARK. Separation of Agriculture Students into

Curriculum and Academic Success Groups by Discriminant Analysis.

Thesis, D.Ed., 1964, The Pennsylvania State University. 118 p.

Library, The Pennsylvania State University, University Park.

Purpose.--To determine whether discriminant functions computed from measures of aptitude, personality traits, vocational interest tests, and high school rank will separate freshman male students into curriculum and academic success groups. The hypotheses concerned agriculture students graduated in science and general programs, graduates and dropouts, comparison with other academic divisions, and application for the advanced Air Force ROTC program.

Method.--Three distinct groups of male students of The Pennsylvania State University freshman class of 1957 comprised the sample for the study. There were 333 students from the College of Agriculture, 199 from the College of Education, and an all-University sample of 1215 students who elected the basic Air Force ROTC program.

The 45 independent variables used in the study were measurements of aptitude, personality traits, vocational interests, and high school graduation rank. These data were obtained by the Division of Counseling during Freshman Orientation Week. The IBM 7074 Computer located at The Pennsylvania State University Computation Center was programed for the discriminant analysis statistical technique and used to process the data. Discriminant functions, critical scores, and individual "V" scores were computed and used for classification of individuals into "curriculum" groups and "academic success" groups to which they belonged. Values of *t* were used to test significance of percentages of separation between student groups. Three major and nine auxiliary hypotheses were formulated to test significance of separation in nine dichotomous groups selected as dependent variables.

Findings.--The results of testing the hypotheses formulated for the study were that all groups of students included in the statement of the problem were significantly separated. By computing discriminant functions and individual "V" scores based on high school graduation rank and scores made on aptitude, personality trait, and vocational interest tests which are given to all entering freshmen, agriculture students can be significantly separated into the curriculum and academic success groups to which they belong. This capability adds a valuable guidance technique to those presently available.

3361. RICHTER, ALEXANDER R. A Study of Youth in Part- and Full-Time Farming in Five Wisconsin Counties. Thesis, M.S., 1964, University of Wisconsin. 74 p. Department of Agricultural and Extension Education, University of Wisconsin, Madison.

Purpose.--To assess the differences and similarities found between youth engaged in part- or full-time farming and their perception of the largest problem of becoming established in farming.

Method.--The group studied consisted of the 1957 male freshmen of the following five counties: Adams, Iowa, Manitowoc, Polk, and Price. Data from 100 respondents were studied. Data used in the study were gathered from a series of three questionnaires which had been administered between December 1957 and August 1963. All data were placed on IBM cards and electronically computed. For the purpose of the study descriptive techniques such as percentages and arithmetic means were primarily relied upon to analyze the data. Chi square was figured on several relationships to determine significance.

Findings.--The results of this study of 1963 part-time farmers reveals that 71 percent of the youth in Manitowoc County were part-time farmers whereas 29 percent were full-time. In Iowa County the trend was different with approximately a two-to-one ratio favoring full-time farming.

There were no differences evidenced by the father's farming status or for the youth who were engaged in part- or full-time farming. The fathers of over three-fourths of the farming youth owned their own farms. The father's classification in farming did not appear to be a factor in selecting part- or full-time farming as an occupation by the youth.

Although the data were not statistically significant, one-half of the total number of respondents had decided to farm as ninth graders, while slightly more than one-third were undecided about their occupational plans. Eleven percent of part-time farming youth who stated they definitely would not farm as ninth graders were engaged in farming while nine of the full-time farming youth had responded negatively to farming as an occupation. Fifty percent of the total respondents had goals of becoming an owner-operator. A little over six percent planned to continue in their present farming status, and 12 percent planned to leave farming when the opportunity presented itself.

The parents were the largest source of influence within the family accounting for 70 percent, while one out of four reported no one in the family as being influential in the occupational decision-making process. Over two-thirds of the total respondents felt that no one within the various organizations or society was influential in the occupational decision-making process.

Seven out of ten of the part- and full-time farming youth indicated the largest single problem to be of a financial nature. Twenty-seven percent indicated general economic conditions to be the largest single problem of becoming established in farming.

Forty percent of the part-time farming youth were undecided, and 23 percent of the full-time farming youth responded that they were undecided in their goals toward farming. The part-time farming youth participated more than full-time farming youth in vocational trade or armed forces schools since high school. The degree of participation was found significant at the .05 level of significance. The full-time farming youth had a higher rate of participation in young and adult farmer classes since high school than did part-time farming youth. This finding was significant at the .01 level. A higher percentage of the youth now engaged in full-time farming were high school graduates than the youth now farming part-time.

3362. ROBINSON, NORMAN LYLE. Competencies in Farm Machinery Maintenance Needed by Farmers. Thesis, M.S., 1964, Iowa State University of Science and Technology. 88 p. Library, Iowa State University of Science and Technology, Ames.

Purpose.--To determine the competencies in farm machinery maintenance, repair, and adjustment needed by present and prospective farmers.

Method.--A group of key farmers identified the necessary competencies needed by farmers in farm machinery maintenance, repair, and adjustment of 12 farm machines. A questionnaire developed from this list was submitted to 300 farmers who were graduated from Iowa high schools from 1950-1954, and to 300 farmers who were very proficient in the use of farm machinery. For brevity, competencies pertaining to only 4 of the original 12 machines (tractors, plows, corn planters, and mowers) were included in the questionnaire. Farmers evaluated (1) the degree each competency was needed to properly maintain, repair, and adjust farm machines, and (2) the degree to which each competency was possessed. The first 200 usable questionnaires returned by each group made up the final sample (400). Responses indicating degree of competency needed and possessed were analyzed using mean scores.

Findings.--Highest overall scores for competency needed for both groups were found in the areas of tractor overhaul, adjusting tractor overhaul, adjusting tractor hydraulic systems, and adjusting and overhauling tractor carburetors. There was a significant relationship observed between the degree of competency needed scores given by the outstanding farmer group and those given by the 1950-1954 graduates, as indicated by a Spearman rank order coefficient of correlation of .993.

The outstanding farmers indicated that they possessed the most competence in replacing tractor oil filters, adjusting corn planting rates, and providing tractor battery maintenance.

A need for more competence than they possessed was indicated by the outstanding farmers for 16 of the 47 competencies, and by the 1950-54 graduates for 14 of the 47 competencies. In the areas where the outstanding farmers felt a need for more competence than they possessed, competencies showing the greatest mean difference were: performing a complete tractor overhaul and hammering out worn plow shares. Competencies with greatest mean differences for the 1950-54 graduates were: hammering out worn plow shares and hard-surfacing plow shares.

The top 10 machine competencies, as rated on competency needed by the outstanding farmers, were identified. The highest competency mean, performing a complete tractor overhaul, was compared with the other nine means by use of the t-test. Computed t-values showed five combinations to be highly significant for the outstanding farmers and three for the 1950-54 graduates. Eight combinations were significant at the 5 percent level.

3363. ROBINSON, TED RICHARD. Factors Related to the Occupations of Iowa Farm Male High School Graduates. Dissertation, Ph.D., 1964, Iowa State University of Science and Technology. 257 p. Library, Iowa State University of Science and Technology, Ames.

Purpose.--To investigate the relationship of the following selected factors to the occupations of Iowa farm male high school graduates during the period of 1950 to 1954: (1) the relationship between the graduates' occupations and the geographical location of their high schools, (2) the relationship between the graduates' occupations and selected characteristics of their home environments, (3) the relationship between the graduates' occupations and their educational backgrounds, and (4) some measures of the occupational status of the graduates.

Method.--Selected educational, environmental, occupational, and ability data were obtained from the records of 165 Iowa high schools and from questionnaire responses from 5,722 former graduates (71.61 percent) of these high schools. The selected high schools had offered an approved three or four year vocational agriculture program to the members of at least one of the graduating classes from 1950 through and including 1954. Graduates included in the study were those whose fathers were farmers on the day of their graduation or who had been farming during most of the time that the graduates were in high school and others who had completed six or more semesters of vocational agriculture.

Apparent biases resulting from differential response rates by the graduates classified according to their high school graduating class quartile rank and the size of their graduating classes were reduced by post-stratification of the population.

Findings.--Grouping of graduates by occupations indicated that 29.6 percent were farmers and farm managers, 13.3 percent were engaged in off-farm agricultural occupations, 1.9 percent were farm laborers, and 55.1 percent were engaged in non-agricultural occupations.

Chi square analyses revealed highly significant relationships between the agricultural classification of the graduate's occupation and (1) extent of migration; (2) Iowa economic area of the high school; (3) size of home farm; (4) father's farming status; (5) number of siblings; (6) semesters of vocational agriculture; (7) quartile rank in high school graduating class; (8) year of graduation; (9) post-high school education; and (10) type of post-high school educational institution attended.

A higher percentage of graduates from areas with a high level of living index were farmers and farm managers whereas more of the graduates from low index areas entered non-agricultural occupations. Highly significant relationships existed between the census classification of the graduate's occupation and education of father and mother, semesters of science, and semesters of mathematics.

Occupational income, high school activity participation, and quartile rank tended to be positively correlated with the migration of the graduates. Likewise, Iowa economic area, level of living index of home, number of siblings with a college degree, semesters of science, semesters of mathematics, and semesters of vocational agriculture were related to the migration patterns of the graduates.

From the analysis of variables pertaining to all graduates, positive correlations were derived between the occupational prestige scale value and quartile rank (.335), semesters of mathematics (.228), occupational income (2.85), and enrollment in a post-high school educational institution (.364). Income received by the graduates was positively correlated with quartile rank (.128), extracurricular activity participation (.154), and post-high school education (.125), and it was negatively correlated with recency of graduation (-.113).

4465. ROGERS, CHARLES H. Factors Associated with Supervising Teacher Effectiveness. Thesis, Ed.D., 1964, Cornell University. 190 p. Library, Cornell University, Ithaca.

Purpose.--(1) To identify certain personal and professional characteristics of supervising teachers which influenced the performance of their role, and (2) to determine the influence of various kinds and amounts of professional training on the performance of the supervising teacher.

Method.--Using a jury of outstanding leaders in agriculture teacher education and the head teacher educators of the agricultural education departments from the North Atlantic and Southern Regions, a scale was developed for the evaluation of the performance of supervising teachers. The agricultural education departments from each of the teacher education institutions furnished a list of supervising teachers who served during the 1962-63 academic year along with completed supervising teacher performance rating scales for each teacher. The supervising teachers for each institution were then placed into three groups based on their performance scores--most effective, moderately effective, and least effective. The most effective teachers from each institution composed one study group in the investigation and the least effective teachers from each institution composed the other group.

Data relative to personal and professional characteristics of supervising teachers were collected by means of a mailed questionnaire. Of 200 supervising teachers who were included in the most effective and least effective groups, 195 completed and returned questionnaires.

Comparisons were made between the most effective and the least effective groups to determine differences in characteristics for which data were collected, and to test the 20 study hypotheses. For the purpose of testing hypotheses, the data were analyzed using the t-test and chi square test.

Findings.--The following characteristics were identified which influenced the performance of the supervising teacher: (1) the age of the teacher, (2) employment mobility, (3) experience as a supervising teacher, (4) the academic degree held, (5) professional reading, (6) participation in professional organizations, and (7) participation in local community organizations. No differences were found between the most effective and least effective groups of supervising teachers for the following characteristics: (1) previous occupational experience in education, (2) the number of years of vocational agriculture teaching experience, (3) the number of years the teacher had taught at his present location, (4) the kind and amount of undergraduate and graduate professional training, (5) participation in professional and technical workshops and conferences, (6) the amount of special college training in student teaching supervision, and (7) participation in supervising teacher workshops.

The findings of this study corroborated the conclusions of earlier research which indicated that supervising teacher performance was influenced by the following factors: (1) previous experience as a supervising teacher, (2) academic degree held, (3) reading of professional literature, (4) participation in professional organizations, and (5) participation in local community organizations. However, earlier research which concluded that previous occupational experience in education, professional training, special supervising teacher training, and job satisfaction influenced supervising teacher performance was not supported by the findings of this study.

3365. SANDSTEDT, NEIL R. Drop-outs in Agriculture. Thesis, M.Ed., 1965, Colorado State University. 89 p. Library, Colorado State University, Fort Collins.

Purpose.--To determine the factors influencing students to drop out of the agricultural curriculum at Northeastern Junior College before completing the prescribed course of study.

Method.--Data for the study were collected from the records of the Registrar and by means of a questionnaire completed by 75 drop-outs for the years 1958 to 1964.

Findings.--Data indicated that of the 75 respondents, 33 percent were currently engaged in production agriculture, 17 percent were students, 15 percent were serving in the armed services and 35 percent were engaged in off-farm jobs. From a comparison of occupations it was found that 20 percent of the 75 respondents engaged in production agriculture had fathers that were likewise engaged.

Grade averages of 33 percent of the respondents were "C" or above, 24 percent indicated probationary status, and 43 percent indicated academic suspension. Of those who responded 57 percent dropped out during their freshman year and 43 percent dropped out during their sophomore year.

Factors which influenced the 75 respondents to drop out, in order of importance, were: lack of vocational objective, difficulty of college courses, academic suspension, transferred to another college, no financial assistance available from parents, needed to be home to work, and inadequate high school preparation. Of lesser importance were: offered a job opportunity, too much time spent on social activities, poor study conditions in room, classroom facilities, and farm or business could not support college. Quality of instruction in agriculture was not found to be a factor of consequence.

3366. SCHOOLCRAFT, ARTHUR GRANT. Parliamentary Procedure Contest Offerings, Evaluation and Future Developments. Thesis, M.S., 1964, West Virginia University. 51 p. Department of Agricultural Education, West Virginia University, Morgantown.

Purpose.--To examine the possible methods for improving the scorecard for the West Virginia Association of Future Farmers of America Parliamentary Procedure Contest.

Method.--The data for the study were collected from 33 states having a parliamentary procedure contest. Four states reported that no contest of this type was being used; thirteen states did not reply.

Findings.--Parliamentary procedure contests actually demonstrate democracy in action. Clarity of transactions was a point judged by many States, but not considered in West Virginia. The following points were most used in judging parliamentary procedure contests throughout the State associations, including West Virginia. These are listed in order of major importance: (1) Ability of presiding officer, (2) Secretary's minutes, (3) Voice and expression, (4) General ability to team, and (5) Response to judges' questions.

Unclassified motions were listed only on the West Virginia scorecard. Bonus motions were listed by only two States other than West Virginia. Dress and neatness appeared on only three State association's scorecards. It is evident that these items are not felt to be of major importance except in a small percent of the contests. Whereas clarity of transactions was considered important in 11 states, it is not listed on the West Virginia scorecard.

This study indicated that the following changes should be made in the official West Virginia Parliamentary Procedure Contest scorecard: (1) The bonus motion should be discontinued, (2) Unclassified motions should be discontinued, (3) The heading for dress and neatness should be discontinued, and (4) Clarity of transactions should be added.

3367. SHOUP, CHARLES A. Factors Affecting the Occupational Choice of Agricultural Education Graduates. Thesis, M.S., 1965, Cornell University. 83 p. Library, Cornell University, Ithaca.

Purpose.--To determine why some agricultural education graduates enter occupations other than teaching vocational agriculture.

Method.--The 123 men who were enrolled in the agricultural education program at Cornell University and who did their student teaching in vocational agriculture in the years 1955 to 1960 were included in the study. Selected background information concerning these graduates was obtained from their permanent college records. Questionnaires with 47 factors which might have influenced the decisions of agricultural education graduates to enter other occupations were sent to the 39 graduates who had not taught vocational agriculture but who had entered a civilian occupation. They were asked to indicate whether each factor was very important, somewhat important, or not important in influencing their decision. By weighing each response a total score was computed for each factor. The graduates who had taught were compared by use of the chi square technique with those who had not taught but who had entered a civilian occupation.

Findings.--Sixty-four percent had taught vocational agriculture. Of those who had entered other civilian occupations, nearly 40 percent entered other kinds of secondary school teaching, 27 percent became county 4-H or agricultural agents, 9 percent became farmers and the remainder entered 8 different occupations.

The 10 factors which the respondents indicated as having had the strongest influence on their decisions to enter other occupations, in order of their importance, were: (1) more chance for personal achievement in the job taken, (2) the trend toward fewer vocational agriculture departments and less emphasis on vocational agriculture, (3) their belief that many vocational agriculture students aren't really interested in agriculture and/or farming, (4) greater possibilities for promotions and financial advancements, (5) promotions based on one's ability offered to a greater extent in occupations other than teaching vocational agriculture, (6) the available vocational agriculture teaching jobs were in geographical areas where they did not care to live and/or teach, (7) the belief that many students in vocational agriculture would be below average academically, (8) their goals in life could be attained in other occupations better than by teaching vocational agriculture, (9) higher starting salary in the job accepted, and (10) student teaching experiences that discouraged them.

When the teaching and non-teaching groups were compared, it was found that significantly higher number of those with four to seven units of high school vocational agriculture taught than those with two units or less. Those who were farm-reared were found to have taught in significantly more cases than those who were not farm-reared. A significant positive relationship was found between the grade received for student teaching and the incidence of teaching vocational agriculture.

No significant differences were found in grades received in the New York State High School Regents Examination in Vocational Agriculture, the final college cumulative average, or the age at graduation.

3368. SIMEK, MELVIN T. A Study of the Image of Vocational Education in South Dakota Public Schools. Thesis, M.Ed., 1965, South Dakota State University. 99 p. Library, South Dakota State University, Brookings.

Purpose.--To discover the revisions and additions in the vocational curriculums of South Dakota public schools that are needed to better prepare youth for employment.

Method.--Information was secured from South Dakota school administrators who had one or more vocational departments, from vocational agriculture teachers, and from vocational homemaking teachers. Information was gathered through mailed data gathering instruments.

Findings.--The findings related to three concise considerations: (1) curriculum development and administration, (2) socio-economic and academic aspects, and (3) teacher-administrator relationships. The investigation indicated that both vocational homemaking and vocational agriculture teachers should endeavor to project the importance of their programs. There is a considerable awareness of the quality, value, and worth of the vocational education programs.

Results of the investigation showed that school funds and qualified teachers could be better utilized if a vocational education program served a geographic area larger than the regular school district. The research revealed that local school districts could not finance expanded vocational education programs without Federal and State aid. Colleges were providing adequate professional training for vocational teachers, but there is a need for more in-service professional training.

There is some evidence that students enrolled in vocational education are subjected to more social disadvantages than those in non-vocational education. It was further recognized that boys who live in towns and are interested in working in farm-related agricultural fields should have an opportunity to enroll in vocational agriculture classes.

3369. SINHA, HARI SHANKER PRASAD. The Development of Agricultural Education in India. Dissertation, Ph.D., 1965, University of Missouri. 340 p. Library, University of Missouri, Columbia.

Purpose.--To trace the origin and development of agricultural education in India with major emphasis placed on non-degree programs.

Method.--Data were obtained from (1) a comprehensive survey of annual government yearbooks, Five Year Plans, United Nations reports, and periodicals, (2) Indian government reports on the progress of education since 1886 and the progress of agriculture since 1905, and (3) curricula of institutions in different States of India.

Findings.--India is predominately rural with 70 percent of the population depending on agricultural occupations. More than 76 percent are illiterate. Tradition, the barrier to change, makes for inefficient agricultural practices and low productivity. The country has been plagued for generations by famines. The Department of Agriculture was established in 1871 on the recommendation of Famine Commissions.

Agricultural education is organized at three levels: primary, middle, and high school. In the rural primary schools scientific agriculture has not been taught as such. Nature study and school gardening were introduced as innovations. But these were discredited on the ground that they failed to provide government jobs. Basic education was initiated in 1937 by Mahatma Gandhi, who emphasized the principle of learning by craft. After independence, basic education became the foundation stone of education. Two different types of middle agricultural schools have been evolved. They are vocational and rural-bias schools. The vocational program included training in agriculture. It was expensive, and it did not provide a prospect for government jobs or make it possible for students to continue their education in higher institutions, if they wished to do so. The aim of the bias school was to give a vocational bias toward agriculture and to improve the status of farmers. Currently, the middle schools are being converted into basic schools. Before independence, teaching of agriculture in high schools was optional and the offerings proved to be quite theoretical. The Secondary Education Commission of 1952 recommended diversified courses for high schools and led to the establishment of multi-purpose schools in 1955.

Teaching by extension has made use of visual demonstration procedures and the offering of practical short courses. Illiteracy still prevailed when India became independent in 1947. The average cultivator still had not accepted improved practices of farming. Community development emerged thereafter with the idea of helping the people to help themselves. In 1960 an Intensive Agricultural District Program was launched by the Department of Agriculture to meet recurrent food crises.

3370. SKEANS, CHARLES N. A Post-High School Agricultural Education Program for Jefferson County. Thesis, M.Ed., 1964, Oregon State University. 57 p. Department of Agricultural Education, Oregon State University, Corvallis.

Purpose.--(1) To determine the number and kind of positions and opportunities for employment in agriculture in Jefferson County, Oregon, and (2) to propose a post-high school plan based upon sound principles that will provide the necessary educational training for an employee to obtain and hold a job in the field of agriculture.

Method.--Available job opportunities in Jefferson County in the field of agriculture were determined by personal interviews with all of the businesses and farmers in the county. A random sampling of 125 students who graduated from the high schools in the county from 1959-1963 were sent questionnaires. The questionnaires were designed to determine: (1) the percent of students leaving high school and obtaining jobs in agriculture, and (2) the level of training or other preparation they had for their occupation.

Findings.--Approximately 75 percent of the working force was engaged in agricultural occupations. Agricultural occupations were grouped into the following categories: Agricultural Production, 53 percent; Agricultural Processing, 12 percent; Agricultural Services, 7 percent; Agricultural Sales, 2 percent, and Professional Agricultural Occupations, 0.7 percent. The questionnaires indicated that (1) 45 percent of the graduates had not had further training; (2) 5 percent of the graduates were in military service; (3) 12 percent of the students had had one year of training following high school graduation; and (4) 38 percent were enrolled in schools for further educations. The average educational level for those 25 years of age and older was eleventh grade for males and twelfth grade for females.

The study indicated a need for post-high school education and that a large portion of the instruction should be in the field of agriculture. Eleven principles were developed which could be used as a framework for developing a post-high school educational program for Jefferson County. These principles were: (1) Courses should be based upon an occupational survey; (2) Programs should be a part of rather than separate from the school system; (3) Adults need and desire to learn and their rate of learning is equal to high school students; (4) Post-high school students need work experience; (5) School districts should be large enough to offer courses needed for specialized occupations; (6) Programs should satisfy the needs of students who are leaving high school or who do not enroll in colleges, technical schools, or trade schools; (7) Programs need to be orientated to the community and its needs; (8) Classes should be organized and scheduled as to time and location; (9) Courses should be publicized; (10) Basic principles pertaining to learning and subject matter are common to all areas including agriculture; and (11) Programs should be correlated to the occupations survey of the area.

3371. SMITH, CHARLES O. Suggested Teaching Plans for Use in Teaching Selected Electrical Units in Vocational Agriculture. Thesis, M.Ed., 1964, Cornell University. 72 p. Library, Cornell University, Ithaca.

Purpose.--To provide agriculture teachers with a cohesive, logical arrangement of farm electrification units together with some suggested teaching plans for these units.

Method.--A review was made of all literature distributed by the New York State Electric and Gas Corporation, as well as literature from other electric power companies throughout the United States. A further review of courses of study and lesson plans published by agricultural teacher training institutions throughout the country and a survey of the studies of agricultural education were made to determine those relevant. Interviews were conducted with staff members of the Agricultural Education Department and the Agricultural Engineering Department at Cornell University, and the study was discussed with agriculture teachers. The prepared units were then submitted to the Agricultural Engineering staff of the New York State Electric and Gas Corporation to be checked for technical accuracy.

Findings.--This study resulted in the development of a series of lesson plans for teaching selected electrical units in agricultural education. The units stressed the managerial aspects of farm electrification. The units were made as complete as possible. They included a list of materials needed and explanations for the teachers. No attempt was made to prepare a complete farm electrification course. Other units were to be added by teachers as they deemed it necessary to fit their changing agricultural needs.

3372. SNEPP, NEIL OWEN. Agricultural Offerings in Community Colleges in the United States. Dissertation, Ph.D., 1963, The Ohio State University. 244 p. Library, The Ohio State University, Columbus.

Purpose.--To propose an initial post-secondary program in agriculture at the community college level for Ohio.

Method.--A list of public community colleges with agriculture offerings was compiled. A sample of 161 colleges--equal to 69 percent of the total listing--was drawn. Responses to a mailed questionnaire were received from 72 percent of the sample, and additional data were secured from 44 of the 50 State Directors of Vocational Education.

Findings.--Two types of conclusions were drawn. The first was based upon the existing situation as reported; the second was based upon the respondents' opinions of the most desirable agricultural programs in community colleges. While 30 percent of the public junior colleges listed agriculture as a curriculum, they were, in effect, offering pre-agriculture. Transfer and terminal-technical programs enrolled 80 percent of the agricultural students. Adult education programs in agriculture were nearly non-existant. Agricultural enrollment in the majority of junior colleges was less than 50 students; however, 25 percent of the colleges had agricultural enrollments over 100 students. The most comprehensive agricultural programs were found in the latter group of colleges. State funds were used for capital costs by 90 percent of those reporting. Operating costs were met by a combination of State and local funds and student tuition.

The major problems in establishing and operating agriculture programs in junior colleges were those of attaining public understanding and adequate financial support. Agricultural programs in junior colleges should include transfer, terminal-technical, vocational, and adult education curricula. Twenty-one guidelines were formulated to provide direction for the development of agricultural programs in community colleges.

3373. STARLING, JOHN TULL. A Study of Integrating Biological Principles with Instruction in Vocational Agriculture. Dissertation, Ph.D., 1964, The Ohio State University. 146 p. Library, The Ohio State University, Columbus.

Purpose.--To determine the feasibility of integrating biological principles with instruction in vocational agriculture at the high school level in Ohio.

Method.--Procedures included the selection of 15 pilot schools and 8 control schools. The teachers in the pilot schools integrated the teaching of biological principles in solving agricultural problems. The teachers in the control schools conducted a traditional program without any change from the usual methods in the Ohio vocational agriculture program. A pre- and post-test were given to each group, and the test results were analyzed to determine the difference in achievement between the pilot and control groups. The tests included were: California Mental Maturity, Agricultural Achievement, Biology Achievement, and Interest Inventory. In order to secure teachers' opinions, a subjective evaluation was accomplished through the use of a questionnaire.

Findings.--Students in the pilot schools showed significant gains on all tests at either the .01 or .05 confidence level. Student age and achievement in biology were negatively correlated. The older students showed less gain in biology than younger students. The number of principles taught was the most important factor influencing a change in achievement in biology.

Teachers' evaluation was very favorable concerning the extent to which students were able to transfer their understanding of principles in solving other agricultural problems. Eighty percent of the teachers checked "some" concerning students' ability to transfer understanding, and the remaining twenty percent checked "very well." The teachers' evaluation also indicated that the biological principles approach placing more emphasis on "why" rather than on "how" made vocational agriculture more challenging to students.

3374. STEFFY, ROBERT E. An Experiment in the Effectiveness of Combining the Teaching of Business Principles with Farming Program Record Keeping. Thesis, M.Ed., 1965, The Pennsylvania State University. 35 p. Library, The Pennsylvania State University, University Park.

Purpose.--(1) To develop teaching resource materials on business principles and forms and on procedures for use with the Pennsylvania Farming Program Record Book, (2) to test the instructional value of these materials in ninth grade vocational agriculture classes, and (3) to determine whether the materials developed were of greater interest to students having an opportunity to enter farming than they were to students who did not have such an opportunity.

Method.--A 90-page booklet titled, The Application of Selected Business Principles to Farming Program Record Keeping, a resource unit for instructors and students, was prepared. The business principles suggested by the preliminary pages in the record book were explained, examples of proper business procedure were given, and business forms and instruments were provided for the students to study and complete.

In Indiana County, Pennsylvania, 45 ninth grade students in four high schools were provided a copy of The Application of Selected Business Principles to Farming Program Record Keeping and the official record book when they received their first instruction in record keeping. In four other high schools in the same county in the same period, October and November 1964, 58 were taught by the instructor's own method of teaching record keeping and completed the same pages as the other group. Intelligence test scores for the students were used as a control variable. Final test scores were the criterion measure.

Findings.--Students in the classes that had experimental resource materials had scores significantly higher than those who were taught by the teacher's own method. There was no significant difference in the interest of the students who had an opportunity to enter farming and those who did not. The experimental booklet saved time on the part of both the instructor and the student.

It was concluded that the resource materials met the immediate needs of ninth grade students who were studying record keeping for the first time. The teaching of practical business principles can be interesting to students who are planning to enter any occupation. Teachers of vocational agriculture can teach business principles successfully when student materials on business principles are provided.

3375. STEVENS, ANDREW LEE. The Use of Farm Magazines by Teachers of Vocational Agriculture. Thesis, M.Sc., 1964, The Ohio State University. 93 p. Library, The Ohio State University, Columbus.

Purpose.--(1) To determine how teachers of vocational agriculture in Ohio used farm publications; (2) to identify reasons for using magazines, and (3) to obtain teacher reactions to certain magazines.

Method.--A questionnaire consisting of checklists and open-end questions was prepared and mailed to all 309 teachers of vocational agriculture in Ohio; 155 usable replies were returned. One checklist pertained to specific articles in the January 18, 1964, issue of The Ohio Farmer magazine.

Findings.--At least one of the selected articles from The Ohio Farmer was used by 63 percent of the respondents. The most used articles were about farm policies, farmer experiences, technical information, and new developments in agriculture. Teachers indicated a preference for articles written in a concise, easy-to-read language and for articles in a condensed form written by researchers. They indicated farmers would prefer farmer experience articles. Teachers rated general farm magazines more useful than specialty magazines for themselves and for farmers.

"To keep up to date" was listed by 118 teachers as their main reason for using magazines. "Lack of time" was mentioned by 49 of the teachers as a reason for not making more use of magazines. More than 50 percent of the respondents listed student leisure reading and teacher reference as the major functions of magazines. Magazine reports and class references were mentioned as major functions of magazines by 46 and 42 percent of the respondents, respectively.

3376. SWEANEY, H. PAUL. An Evaluation of Two Methods of Teaching Agricultural Mechanics. Staff Study, 1964, Michigan State

University. 48 p. Department of Secondary Education and Curriculum, Michigan State University, East Lansing.

Purpose.--To determine if differences were significant between the outcomes of instruction in agricultural mechanics taught in integrated courses and the outcomes when taught in a separate course in one year.

Method.--Students enrolled in departments of vocational agriculture in Michigan considered above average in the quality of instruction in agricultural mechanics were grouped according to the time when instruction was offered in the secondary curriculum. Areas of instruction and specific content within areas were obtained to identify what was common to either method of scheduling. A test of understanding of scientific principles was developed covering common instructional units. The areas of instruction used were concrete, electricity, welding, power and machinery, and home farm shop.

A performance test involving skills commonly taught to both groups of students was developed and administered in seven centers throughout the State. The size of shops limited the number of students that could be tested at a center. A sample of students from groups which had taken the test of understanding was drawn so that students from all four quartiles would be included in the test of skills in agricultural mechanics. College staff members in agricultural engineering assisted in the testing program in all centers. Since schools offering instruction in agricultural mechanics in separate courses commonly offered it to tenth grade students, twelfth grade students who had enrolled in separate courses in previous years were included as well as those currently enrolled.

Findings.--There were no significant differences in understanding of mechanical principles between students who had received their instruction in agricultural mechanics in separate courses and seniors whose instruction had been integrated with other instruction in vocational agriculture. Seniors who were enrolled in separate courses in previous years were significantly higher in their understanding of mechanical principles than sophomores currently enrolled in separate courses.

Twelfth grade students who previously studied agricultural mechanics in separate courses were significantly higher on tests of performance than the sophomores who were currently enrolled in separate courses, and they were also higher than the seniors who had received integrated instruction. Seniors enrolled in integrated instruction were higher than either the sophomores or seniors who were currently enrolled in separate classes in agricultural mechanics.

Schools wishing to offer a separate course in agricultural mechanics should expect students to achieve as much understanding as those in integrated courses. Students, particularly sophomores, who received their instruction in separate courses may not perform on as high a level of skill as seniors, but they seem to be able to compare favorably or are higher when they become seniors.

3377. THOMPSON, EVANS G. and OTHERS. A Survey to Determine the Opportunities and Training Needs for Career Persons in Agriculturally Related-Distributive Businesses in the Geographical Areas Served by George Wythe High School, Wytheville, Virginia. Staff Study, 1963, Virginia Polytechnic Institute. 45 p. Department of Vocational Education, Virginia Polytechnic Institute, Blacksburg.

Purpose.--(1) To determine the need for trained career persons in agriculturally related-distributive businesses in the area served by George Wythe High School, Wytheville, Virginia. (2) To determine the need and the opportunities for providing training through cooperative part-time jobs in agriculturally related-distributive businesses. (3) To determine any special characteristics of part-time jobs in agriculturally related-distributive businesses. (4) To determine the kind of training needed for various types of jobs in agriculturally related-distributive businesses.

Method.--Data were secured by personal interviews and recorded on a prepared form.

Findings.--The 1,708 employees of the 61 businesses included in the study had 80 different job titles. Ninety-five percent of the employees were employed full-time. The 61 businesses employed 15.5 percent more people than twelve months earlier, and 78 additional employees were needed at the time the survey was made. The employers reported some difficulty in filling 10.9 percent of the job positions, great difficulty in filling 16.0 percent, and extremely great difficulty in filling 9.5 percent. Opportunities were abundant for providing training through cooperative part-time jobs in agriculturally related-distributive businesses in Wytheville, Virginia. Part-time employees needed the same training as full-time employees. Eighty-nine percent of the employees in the 61 businesses needed training in both agricultural and distributive education. A great need existed for trained career persons in agriculturally related-distributive businesses in the area served by George Wythe High School, Wytheville, Virginia. A wide variation existed in the training needs of employees in the agriculturally related-distributive businesses relative to subject matter areas and units.

3378. THOMPSON, JOHN F. State Farm Organization Leader's Perceptions of Vocational Agriculture. Thesis, M.S., 1964, University of Maryland. 122 p. Library, University of Maryland, College Park.

Purpose.--To determine perceptions of vocational agriculture held by State leaders of farm organizations, differences between perceptions of leaders of the three farm organizations, and differences among leaders in terms of age, sex, position, and degree of contact with vocational agriculture.

Method.--A mail questionnaire was sent to the total population of 435 State officers of the Farm Bureau, Farmers Union, and Grange; 85 percent responded.

Findings.--Perceptions concerning vocational agriculture held by leaders of State farm organizations were measured in thirteen areas. The leaders' major perceptions were: (1) The most important purpose of vocational agriculture is to train boys for an occupation in agriculture. (2) Agricultural adult education is an addition to the vocational agriculture teacher's job. (3) The development of rural leadership is the most significant contribution of vocational agriculture to the rural community. (4) Non-farm boys should be on a planned program of placement for farm experience. (5) All citizens should receive some instruction in agriculture, and there should be a 1-year course in general agriculture in all high schools. (6) Vocational agriculture should not necessarily be confined to rural areas, and if taught in suburban schools, it should not be confined to a vocational course only.

In general, vocational agriculture was perceived to be vocationally oriented by Farmer's Union leaders, generally oriented by Grange leaders, and vocationally oriented but limited to rural and farm activities by leaders of the Farm Bureau. Perceptions of leaders under 36 years of age differed from those in the older age groups. A slight difference in perceptions existed between the presidents-masters, vice-presidents-overseers, and secretaries. Larger differences existed among the other officers.

3379. THOMPSON, O. E. and GORDON, SARA F. The Agricultural Student. Staff Study, 1964, University of California. 59 p. Department of Agricultural Education, University of California, Davis.

Purpose.--To determine if commitment to a college of agriculture and various student characteristics are related to such factors as changes in major, scholastic record, or withdrawal from college.

Method.--The 1960 freshman students in the College of Agriculture, University of California, Davis, completed a questionnaire designed to provide a picture of family backgrounds, reasons for attending college, educational expectations, previous leadership experiences, and post-college plans. The questionnaire with minor modifications was administered a second time to 196 seniors in the College of Agriculture who were in the original group. A separate follow-up questionnaire was mailed to 72 persons who were no longer in residence.

Findings.--The data confirmed the following: (1) The student who was committed to agriculture as a freshman was more likely to remain in agriculture and less likely to withdraw from college than was the uncommitted student. This was particularly true for male students.

(2) There was much mobility among majors and between colleges in this group. By the time they reached their senior year, only one-fourth of the original group were still in the major in which they had enrolled originally. (3) The agricultural students did not come from typical California families. About 40 percent had fathers who were four-year college graduates and came from families with incomes over $11,000, almost twice the average in the 1960 census. The fathers were predominately Republican in a State which had a Democratic majority. (4) Potentially, up to 90 percent of the sample could have received four-year college degrees. Sixty-two and a half percent were enrolled as seniors, and, of those who had withdrawn, most were in college elsewhere or planned to re-enter college.

3380. TRAMMEL, JOE ALLEN. Criteria to Use in Selecting Content for a Vocational Agriculture Curriculum and Determining the Grade in Which the Material Should Be Taught. Thesis, M.A., 1964, University of Minnesota. 154 p. Department of Agricultural Education, University of Minnesota, St. Paul.

Purpose.--(1) To test the use of selected criteria in determining the curriculum content for vocational agriculture, and (2) to employ the use of other criteria to determine the grade or grades in which to teach the curriculum materials.

Method.--Criterion used to select curriculum content were as follows: (1) frequency of use, (2) geographic universality, (3) universality in time, and (4) cruciality. The following criteria were used to determine the grade or grades in which the curriculum materials should be taught: (1) frequency of use, (2) chronology, (3) simple to complex or complexity, and (4) cruciality.

A questionnaire was mailed to vocational agriculture instructors in local departments who had served as instructors for student teachers during the years 1961-62, 1962-63, and 1963-64. Questionnaires were also sent to the officers of the Minnesota Vocational Agriculture Instructors Association. Names were then selected at random from other vocational agriculture departments in the State. The questionnaire was developed by listing jobs, skills, and problem areas related to each of seven enterprise areas of instruction. The areas were sheep, beef, dairy, swine, small grains, forage crops, and soils. A questionnaire for each enterprise was developed and sent to 15 instructors. A total of 105 questionnaires were mailed.

Findings.--Geographic universality, universality in time, and cruciality (in that order) were then selected most often as the rationale for including subject matter in the curriculum. The plurality of the respondents indicated that subject matter items from the seven enterprise areas (sheep, beef, dairy, swine, small grains, forage crops, and soils), would be included in their curriculum as determined by the criterion, "Frequency of Use." The plurality of the respondents indicated that the enterprises would be taught in Agriculture II because of "Frequency of Use." Many of them indicated that certain phases of each enterprise would be taught in other years as well as in Agriculture II.

It was concluded that each teacher must determine the items worthy of inclusion in the curriculum and apply the criteria for determining the year or years in which to teach the material in the light of the local situation.

3381. TUCKER, CARL BRITTON. Certain Variables Associated with the Participation Behavior in Formal Voluntary Organizations of Household Heads in Three Rural Communities. Thesis, M.Ed., 1963, North Carolina State University, Raleigh.

Purpose.--(1) To determine the intensity of formal participation in voluntary organization by heads of households and the extent to which certain variables influenced their participation; and (2) to determine the present and future needs in planning and conducting agriculture programs by analyzing the factors influencing formal voluntary participation.

Method.--A questionnaire was used to interview 65 heads of households as a 10 percent random sample of the 650 homes in the 3 communities. Each household head selected was personally interviewed to obtain information that would reveal (1) the intensity to which he participated, and (2) the extent to which his age, education, occupation, income, length of residence, assets, and social status influence his participation. Chi square tests were used to test the significance of observed differences. The coefficient of contingency was used to determine the degree of association between participation and each independent variable.

Findings.--Formal participation by heads of households was related to their age, education, occupation, income, length of residence, ownership, and social status. On each of the independent variables, excluding age, persons with higher rank consistently had higher participation scores. Middle-aged individuals, 35-49 years, participated more intensively in formal voluntary organizations than younger and older individuals. A knowledge and understanding of the influence that certain variables have on participation in formal voluntary organizations would aid in planning and conducting an effective agricultural program.

3382. TUGEND, DAVID MARTIN. Comparative Study of Selected Farm Mechanical Skills Performed by Successful Maryland Farm Operators and Farm Mechanical Skills Taught in Vocational Agriculture in Certain Maryland High Schools. Thesis, M.S., 1964, University of

Maryland. 124 p. Library, University of Maryland, College Park.

Purpose.--To determine if farm mechanical skills performed by successful farm operators were being taught in high school vocational agriculture courses.

Method.--The transposed variation of the standard error formula was utilized for determining the successful farm operator sample size. A jury was selected to validate 100 farm mechanical skills in five areas of agricultural engineering.

Eighty successful farm operators, randomly selected from eight Maryland counties were interviewed. Farm operators were asked (1) to indicate which of the 100 farm mechanical skills were used in their farm operations between April 1, 1959, and April 1, 1963; (2) to identify persons performing the skills used; and (3) to indicate the level of knowledge they possessed for skills applicable on their farms.

Forty Maryland vocational agriculture teachers were sent questionnaires asking them (1) to indicate which of the 100 farm mechanical skills were taught to in-school students between June 1, 1961 and June 1, 1963 and (2) to explain why certain skills were not taught during this instruction period.

Findings.--This study found that due to a greater proportion of teachers who were teaching in-school students to perform farm mechanical skills than the successful farm operators who were performing the skills, there was a significant difference between the number of skills performed by the farm operators and the number of skills taught by the teachers. Over two-thirds of the successful Maryland farm operators not performing farm mechanical skills used on their farms indicated they were not trained to perform the skills. The most frequest reason why certain farm mechanical skills were not taught by Maryland vocational agriculture teachers was a lack of equipment. However, a 0.48 positive correlation existed between the farm mechanical skills performed by successful Maryland farm operators and farm mechanical skills taught by Maryland vocational agriculture teachers.

3383. UELAND, ERMAN O. Attitudes of High School Teachers Toward Agricultural Education in Polk County, Minnesota. Thesis, M.A., 1965, University of Minnesota. 70 p. Library, University of Minnesota, St. Paul.

Purpose.--(1) To determine the attitudes toward agricultural education of teachers in fields other than vocational agriculture in the public high school, (2) to determine the possibilities of expanding agricultural education into other curriculums through the use of an agricultural specialist resource person, and (4) to determine the influence a vocational agriculture program may have on teacher attitudes toward agricultural education.

Method.--A selected set of statements was submitted to all teachers in six schools in Polk County. School administrators and vocational agriculture teachers were omitted. The attitude survey form was distributed and collected by either the school administrator or the vocational agriculture teacher.

Findings.--(1) There were no great differences in attitude toward agricultural education among the teachers. (2) Elementary teachers tended to agree more strongly than other teachers that all students should receive some instruction in the field of agriculture. (3) Teachers in schools with vocational agriculture departments tended to have a more favorable attitude than teachers in schools without such a department. (4) Many teachers were not informed about the FFA. (5) Based on the number of teachers who felt that college-bound students should not take four years of vocational agriculture, more publicity needs to be given to the college preparatory value of the agriculture curriculum.

3384. VAN LOH, FREDERICK ALVIN. Competencies in Agriculture Needed by Males Employed in Retail Fertilizer Distribution. Thesis, M.S., 1964, Iowa State University of Science and Technology. 110 p. Library, Iowa State University of Science and Technology, Ames.

Purpose.--To determine the important agricultural competencies needed by males employed in retail fertilizer distribution and the degree of competency needed and possessed by employees in each competency.

Method.--A panel of 12 specialists from independent, cooperative, and incorporated retail fertilizer firms in Iowa and from the Iowa State University of Science and Technology faculty identified the important agricultural competencies needed by employees in the various occupational areas in the retail fertilizer industry. A questionnaire was developed from the list and submitted to the 120 Iowa firms offering application and/or spreading services to farmers in 1964 with instructions to indicate (1) the degree the competencies were needed to effectively perform the functions of their jobs, and (2) the degree the competencies were possessed by the employee. Usable data were obtained from 94 managers, 44 sales personnel, and 43 service employees. Responses indicating degree of competency needed and possessed were analyzed using mean scores.

Findings.--Of the 29 agricultural competencies listed by the panel, 14 were understandings and 15 were abilities; 13 of the competencies pertained to various phases of farming and 16 to dealership management and service. Highest overall scores were found for the following understandings and abilities: (1) amounts of fertilizer required for various levels of crop production; (2) seed quality and plant population relative to fertilizer response; (3) weed and insect problems and their control;

(4) interpretation of a soil test report; (5) identification of fertilizer materials, and (6) evaluation of formulas; (7) proper recommendations regarding fertilizer use and keeping fertilization history of a farm; (8) good, new fertilizer practices and recommendations for their use; (9) plant food deficiency in growing crops; (10) recommendations in the absence of a soil test report; and (11) determination of an individual's financial situation and management level. Employer and employee scores for all competencies were higher for the degree of competence needed than for the degree of competence possessed. Employee scores were higher than employer scores for both the degree competencies were needed and possessed.

Relationships between selected control variables and the 10 most needed competencies as rated by all employees were studied using correlation. For the correlation matrix including only managers, farm background was negatively correlated with degree competence was needed for all but one of the competency variables while being positively correlated with degree competence was possessed. A correlation matrix using the same variables but including all employees was developed. Vocational agriculture training was more highly correlated with competencies needed and possessed than the other control variables used. Highest correlation coefficients were found to exist between vocational agriculture training and competence needed for the ability to make recommendations in the absence of a soil test report (.325), competency possessed for the ability to recognize good, new fertilizer practices and to recommend their use (.311), and competence possessed for understanding seed quality and plant population relative to fertilizer response (.290).

3385. VORHIES, RALPH M. Status and Role of the Non-Transfer Agricultural Education Program in California Junior Colleges. Dissertation, Ed.D., 1964, University of Missouri. 177 p. Library, University of Missouri, Columbia.

Purpose.--To determine the past, present, and future role of the junior college in providing non-transfer agricultural education in California.

Method.--The descriptive research method was used. Data were collected: (1) with interview schedules filled out while visiting junior college personnel, (2) with forms mailed to 201 former students who entered college in 1959, (3) with forms sent to employers of cooperating former students, and (4) from information sheets sent to Deans of Colleges of Agriculture.

Findings.--Agriculture has been included in offerings of California junior colleges from their beginning in 1910. Of the 70 junior colleges in the State 19 taught some agriculture in 1963. Only about one-fourth of the students surveyed had finished the two-year agriculture course in junior college. Financial considerations were the most frequently listed reason for withdrawal. Nearly 80 percent of the students had a rural background. About one-half of them had taken vocational agriculture in high school. Most of the courses taught in the agricultural programs at the junior colleges were designed for transfer students. Agricultural technician training was initiated recently by two of the larger agricultural departments. This training was terminal and designed to fit students for jobs in related agricultural fields. The curricula were offered in addition to the regular transfer courses.

A study of the employment history of former students showed about one-fourth of them to be self-employed. Of the other three-fourths, approximately one-third were in production agriculture, another third in non-agricultural areas, and slightly less than a third in occupations related to agriculture.

The opinion survey of employers showed that 70 percent would hire more two-year agricultural trainees from junior colleges. Most of them felt the employees had benefited from the training. Most of the students felt that their college training had helped them advance faster and farther on their jobs than they could have otherwise. Half of them felt that a four-year degree would have been more helpful.

Terminal curricula in agriculture are offered at only three of the four-year colleges in California, Fresno State, Chico State, and at San Luis Obispo campus of California State Polytechnic College. The latter has the largest enrollment and also the largest number of specialization areas. Animal husbandry is the most popular major in agriculture at all three of the four-year colleges. The admission requirements and costs at the State colleges are higher than at the junior colleges.

3386. WAGLEY, LEON A. Educational Requirements for Off-the-Farm Agricultural Occupations in Yuma County, Arizona. Dissertation, Ed.D., 1964, University of Arizona. 119 p. Library, University of Arizona, Tucson.

Purpose.--(1) To determine the essential skills and knowledges needed by individuals for both initial employment and upgrading on the job in the competency areas of (a) plant science, (b) animal science, (c) agricultural business management and marketing, (d) agricultural mechanization, and (e) supporting competencies; and (2) to determine the number of persons employed in off-the-farm agricultural occupations in which agricultural education is important in order to analyze the educational requirements for off-the-farm agricultural occupations in Yuma County, Arizona.

Method.--Data regarding off-the-farm agricultural occupations were secured by the interview method from 121 establishments providing some kind of agricultural service to farm operators. The findings were summarized for six levels of employment. The six levels were: (1) professional, (2) technical, (3) supervisory, (4) sales, (5) skilled, and (6) semi-skilled.

Findings.--The most common types of businesses employing agriculturally trained persons were those engaged in sales and service. Over 67 percent

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of the total number of employees in the businesses surveyed were in this category. The next largest group was engaged in providing services and accounted for approximately 25 percent of the total. Employers estimated that slightly over 14 percent of the 5,427 persons employed in the 121 businesses studied needed specific training in agriculture. During the next five years 150 new agriculturally trained employees will be needed in the Yuma area to fill anticipated new positions in these companies. All of the companies planned immediate and/or long-time increases in the number of employees. A number of broad areas of training were indicated by the employers as having considerable importance in providing trained people for service in off-the-farm agricultural occupations. Training in agricultural mechanics and plant science was of major importance while training in animal science was of minor importance. Educational needs in salesmanship and customer relations were rated higher than agricultural training needs for employees of these businesses.

The general reaction of employers to possible training programs for employees in off-the-farm agricultural occupations was positive. Eighty percent of the employers said they would be glad to work with school personnel in planning the curriculum for prospective employees and in conducting the training program. Interest was also expressed in the use of training programs to up-grade the performance of present employees.

3387. WAGNER, LOUIS GERALD. The Economic Importance of Manipulative Skills in Selected Enterprises in Vocational Agriculture in North Dakota. Thesis, M.Ed., 1964, Colorado State University. 160 p. Library, Colorado State University, Fort Collins.

Purpose.--(1) To determine the economic importance of certain manipulative skills in the beef, dairy, swine, sheep, and crop enterprises in North Dakota; and (2) to determine the degree of skill proficiency junior and senior vocational agriculture students possessed in these enterprises and where the skills were learned.

Method.--An instructor, a junior or senior student, and a farmer from each of 54 vocational agriculture departments in North Dakota cooperated in the study by completing questionnaires.

Findings.--Instructors and farmers gave high economic importance ratings in the beef enterprise to the skills of castrating, assisting the cow in calving, vaccinating, spraying for flies, and dehorning; in the dairy enterprise to sterilizing equipment, testing and treating for mastitis, assisting the cow in calving, treating sore udders, and castrating; in the swine enterprise to castrating, assisting the sow in farrowing, and worming; in the sheep enterprise to castrating, assisting the ewe in lambing, docking, drenching, and treating for internal and external parasites; and in crop enterprises to adjusting the combine, preparing the seedbed, rodent-proofing grain storage, applying fertilizer, cleaning and treating seed, cleaning grain bins, calibrating sprayers, and examining seed for purity.

The instructors rated most skills slightly higher than the farmers did. However, the rank among skills within an enterprise was fairly consistent for the two groups. Initially, the farmers thought more beef, dairy, and crop skills should be taught to students, whereas the instructors taught more of the swine and sheep skills. Students indicated they could perform 71 percent of the skills in the beef enterprise and 70, 59, 51, and 84 percent, respectively, for dairy, swine, sheep, and crop enterprises.

3388. WARMBROD, J. ROBERT. Workers Employed and Employment Opportunities for Workers Needing a Knowledge of Agriculture. Staff Study, 1964, University of Illinois. 28 p. Division of Agricultural Education, University of Illinois, Urbana.

Purpose.--(1) To determine the number of workers needing a knowledge of agriculture who were employed in nonfarm business and industrial firms, (2) to determine the number of workers who had been employed in these firms during the past five years, and (3) to determine the estimated number of workers needed in the future due to business growth and employee turnover.

Method.--All nonfarm business and industrial firms in a 14 county region of east-central Illinois comprised the population for the study. Business and industrial firms were identified from the classified sections of telephone directories. A two-stage cluster sampling technique was used to select firms from which data were collected. Business firms were stratified by type of business (degree to which agriculturally oriented) and by size of population center in which the firms were located. Interviews were made by the project staff in 422 business firms.

Findings.--Estimates indicated that a total of 77,868 workers were employed in all business firms (both agriculturally oriented businesses and non-agricultural businesses) in areas of the region with population centers of less than 25,000. It was estimated that 9,636 of these workers were employed in job titles which required knowledge and skill in agricultural subjects. For each 100 agricultural workers employed in areas with population centers of less than 25,000, it was estimated that 10 were working in technician jobs, 71 were working in jobs which required some post-high school education, and 19 were working in jobs which required high school graduation only. Workers needing a knowledge of agriculture who were employed in professional job titles or as unskilled laborers were excluded from the study.

Estimates indicated that for each 100 agricultural workers employed in areas with population centers of less than 25,000, 67 workers had been employed during the past five years due to business growth and employee turnover, 38 workers will be needed in the next five years due to business growth, and 20 workers will be needed in the next twelve months due to business growth and employee turnover. It was estimated that a total of 2,960 workers were employed in agriculturally oriented firms in areas of the region with population centers exceeding 25,000. A total of 1,662 of these workers were employed in job titles which required knowledge and skill in agricultural subjects. In these firms 28 percent of the workers were working as technicians, 46 percent were working in job titles which required some post-high school education, and 26 percent were working in job titles which required high school graduation only.

With one exception, 80 percent or more of all agricultural workers employed in business firms in the region were located within a 25-mile radius of their place of employment. Among the agricultural workers employed as technicians in agriculturally oriented businesses in areas with population centers exceeding 25,000 61 percent were located within 25 miles of their place of employment.

3389. WARREN, JAMES WILEY, JR. A Basis for a Farm Management Instruction Program for Full-time Farmers in the Eastern Supervisory District of North Carolina. Thesis, M.Sc., 1964, The Ohio State University. 105 p. Library, The Ohio State University, Columbus.

Purpose.--To develop a basis for improving farm management instruction in Negro post-high school vocational agricultural classes in the Eastern Supervisory District of North Carolina.

The following specific objectives were defined to accomplish the purpose of this study: (1) To determine the farm management abilities which full-time Negro farmers believe important for success in farming and to identify those in which organized instruction was desired, (2) to consider the relationship of selected characteristics of full-time Negro farmers and vocational agriculture teachers to their perceptions of the farm management abilities they considered important, and (3) to determine the additional organized in-service education which the teachers believed they need to teach farm management abilities to farmers.

Method.--The study included 971 full-time farmers and 92 teachers in 42 eastern counties comprising the Eastern Supervisory District. Data were secured by interviews and questionnaires covering the respondents' perception of the importance of selected farm management abilities for success in farming and the desire of teachers and farmers for instruction.

Findings.--Farmers and teachers similarly perceived 89 percent of the farm management areas and abilities as being of "much" importance to success in farming in their area. Farm management abilities in the crops and records areas were judged most important to success in farming by both farmers and teachers. Farmers evidenced the most desire for instruction in the area of labor, machinery, and buildings management abilities.

Teachers desired in-service education most in the areas of farm mechanics and farm management. The relationships between the recognition of importance of the selected farm management abilities and the need for instruction according to personal characteristics and status of farmers were with few exceptions statistically insignificant.

3390. WEBB, EARL S. A Determination of the Major Professional Difficulties Encountered by Teachers of Vocational Agriculture in Texas. Staff Study, 1963, Texas A & M University. Agricultural Education Library, Texas A & M University, College Station.

Purpose.--(1) To determine the nature and extent of the major professional difficulties encountered by teachers of vocational agriculture in Texas, and (2) to determine the degree to which difficulties were influenced by (a) graduate study, (b) teaching experience, and (c) institutions at which teachers were qualified to teach.

Method.--A questionnaire containing 100 activity-type items was mailed to the 985 white teachers in Texas. Provision was made for respondents to indicate whether they performed or did not perform the activity. Respondents who did not perform an activity were requested to check one of five reasons listed. For the activities that were performed, respondents were asked to indicate one of five degrees of difficulty. A form sent to area supervisors requested a percentage estimate of teachers that needed much improvement in performing 60 of the activities included in the teacher form.

Findings.--Neither graduate study, years of experience, nor institution had significant influence on degrees of difficulty encountered by respondents. In general, there was a high degree of correlation between the levels of difficulty expressed by teachers and the need for improvement expressed by supervisors. The five most difficult tasks were: (1) Presenting television programs, (2) Getting a FFA reporter to write news articles, (3) Requiring students to make budgets of farming programs, (4) Printing FFA Chapter newsletters, and (5) Obtaining models, specimens, and objects to supplement instruction. The least difficulty was encountered in (1) Teaching safety in the shop, (2) Scheduling classtime for studying records of farming programs, (3) Conducting regular supervised study periods, (4) Grading farm mechanics projects, and (5) Providing satisfactory storage for filmstrips and 2 x 2 slides. Conclusions were: (1) Teachers tend to be somewhat optimistic about the degree of difficulty experienced in conducting the various practices and procedures in teaching vocational agriculture. (2) Attitude, rather than knowledge or skills, seems to be the most potent influence in determining whether teachers conduct a practice or follow a procedure in teaching vocational agriculture. (3) The degree of difficulty experienced by teachers in conducting the various phases of vocational agriculture during their early tenure remains relatively constant regardless of years of experience or graduate hours acquired.

3391. WILKINS, VIRGIL L. An Analysis of Factors Which Discriminate in Selection of National FFA Chapter Award Winners. Thesis, M.S., 1965, University of Maryland. 152 p. Library, University of Maryland, College Park.

Purpose.--(1) To determine which standards in the application form for a National Chapter Award discriminate between the achievement levels of National Gold, Silver, and Bronze Emblem Chapters, and (2) to determine the relationship of size of chapter membership to the type of award won.

Method.--Data were taken from National Chapter Award application forms for 1962, 1963, and 1964. Criteria for analysis of data were: (1) number of standards completed, (2) percent of membership participation, and (3) quality and appropriateness of activities conducted. To determine quality and appropriate values for the 32 standards for which descriptive material was reported, an instrument for ranking activities was sent to five individuals who served as national judges during the aforementioned years. Chi square was used to determine the significance of differences and the relationship among variables.

Findings.--The findings were: (1) Fifty-two percent of the objective-type standards failed to discriminate in the selection of National Chapter Award winners. (2) For the most part, standards requiring subjective, descriptive-type reports were highly discriminating and were, therefore, essential in the report form. (3) Size of chapter membership was not a function of the type of award won. (4) Several Bronze Emblem Chapter award winners completed less than one-half of the 93 standards. (5) There was a lack of neatness and adherence to contest rules in the preparation of many forms. (6) Chapters that won a National Emblem Award two or more consecutive years tended to record the same information and activities on each year's applicaton form. The findings led the investigator to conclude that a revision of the report form and the accompanying rules should be made.

3392. WILLIAMS, JOHN R. The Agricultural College Alumni: Who They Are, What They Are Doing, and Their Opinions About the Educational Programs of the College. Staff Study, 1965, University of Arizona. 45 p. Department of Agricultural Education, University of Arizona, Tucson.

Purpose.--(1) To learn more about students who enrolled as freshmen in the College of Agriculture, including their backgrounds, parents' occupations, leadership experiences, high school preparation, factors that influenced their enrollment in the college and selection of their major, academic performance, occupations entered, and salary earned. (2) To access their opinions concerning the effectiveness of the curriculums followed in preparing for the responsibilities of their present job. (3) To get suggestions for improving the curriculums in the college.

Method.--The records of 808 former students who enrolled as freshmen in the College of Agriculture during the 12-year period from September 1946 to September 1957 were studied and a questionnaire mailed to each. The questionnaire was designed to collect additional information about present occupations, opinions, and suggestions about programs of instruction in the college.

Findings.--More than one-half indicated that the curriculum they followed in the college prepared them "very well" or "fairly well" for the responsibilities of their present occupation. More than one-third of the group suggested that the curriculum should include more units in technical subject matter, economics, practical experience in production agriculture, and English and speech. About three-fifths said that if they were starting their college education again, they would attend the College of Agriculture.

3393. WILLIAMS, JOHN R. Occupations and Post-High School Education of Former Students of Vocational Agriculture in Arizona and Their Opinions about Selected Phases of the Program. Staff Study, 1964, University of Arizona. 12 p. Department of Agricultural Education, University of Arizona, Tucson.

Purpose.--To evaluate the effectiveness of the Arizona program of instruction in vocational agriculture in meeting the needs of students.

Method.--A list of the names and current addresses of former Arizona students who enrolled in vocational agriculture for two or more years during the period from June 1953 to June 1962 was compiled. A questionnaire was developed to obtain information on (1) the present occupations of former students, (2) the kind and amount of post-high school education completed, and (3) the opinions of former students as to the effectiveness of selected phases of the vocational agriculture program. Opinions were tabulated according to the following four occupational categories: (1) production agriculture, (2) occupations related to production agriculture, (3) occupations not related to agriculture, and (4) students in higher education.

Findings.--Responses from the 669 former students indicated that 60 percent were employed in jobs that may be permanent, 26.6 percent were post-high school students, and 14.4 percent were in temporary positions such as the armed services and Peace Corps. Among those employed in permanent jobs, 30 percent were in production agriculture and 59.5 percent were in occupations not related to agriculture. Among those taking additional education 22.3 percent were preparing for jobs in production agriculture, 28.6 percent were preparing for occupations related to agriculture, and 48 percent were preparing for occupations not related to agriculture. Almost 39 percent of the former students in temporary positions, such as the armed services and the Peace Corps, indicated they expected to return to production agriculture.

More than 95 percent of the former students attended some kind of post-high school educational institution; 52 percent attended a college or university; 17.6 percent attended a junior college; 9.5 percent attended a technical-vocational school; and 16.4 percent attended a variety of other schools.

The respondents indicated that the vocational agriculture program was most useful in helping them develop the following abilities: (1) working harmoniously with others, (2) exercising leadership, and (3) performing farm mechanics skills effectively. The program was least useful in helping them develop the ability to study effectively. Respondents indicated that the areas of the program most useful in helping them enter and advance in their present jobs were: (1) FFA activities, (2) record keeping and analysis, and (3) instruction in farm mechanics. Areas that contributed least to helping them enter and advance in their present jobs were: (1) occupational planning, (2) cooperative activities, and (3) field crop production information. When asked if they were to repeat their high school education, would they study "more," "the same amount," or "less" vocational agriculture, 87.5 percent said they would study more or the same amount. Only 12.6 percent said they would study less or had no opinion.

3394. WOLFF, FRANK J. and GRADONI, E. JOHN. Employment Opportunities and Competencies Required for Entry in Selected Occupations in Agricultural Businesses in Three Communities in New York State. Staff Study, 1964, New York Education Department. 17 p. Bureau of Agricultural Education, New York Education Department, Albany.

Purpose.--(1) To survey agricultural business employers regarding competencies needed by workers entering agricultural business occupations. (2) To learn the nature and extent of the occupational opportunities to guide the development of courses of study for new programs in agricultural business.

Method.--Data were collected in three of twelve communites outside of the large cities where both the teachers of agriculture and the distributive education coordinators were employed. The three communities were selected because of the interest of the teachers and coordinators in the project. In each community the teacher and the coordinator selected a minimum of 20 agricultural businesses. Working together, they interviewed a responsible individual in each business. A simple survey instrument was used to determine, by job title (1) the number of full-time and part-time employees, the level of employment, and the estimated number of permanent replacements needed annually; (2) the number of employees, both full-time and part-time, who were classified as permanent or temporary (seasonal) workers; and (3) the desired qualifications for entering each occupation.

Findings.--The sample included firms and/or agencies, representing 24 different types of businesses and covering 7 agricultural occupational families. The percentages of full-time workers by occupational family are: agricultural machinery sales and service, 12.2 percent; agricultural supplies and equipment, 28.3 percent; dairy manufacturing, processing and sales, 12.5 percent; other agricultural sales and services (not elsewhere classified), 8.3 percent; ornamental horticulture production, sales, and service, 11.4 percent; food products production, processing, and wholesaling, 21 percent; and retail food sales, 6.3 percent.

The majority of part-time workers were found in the latter three occupational families. The percentages of full-time workers by major grouping, Dictionary of Occupational Titles, were as follows: professional and managerial, 30.5 percent; clerical and sales, 20.4 percent; service and agricultural, 16.7 percent; skilled, 8.3 percent; and semi-skilled and unskilled, 24.1 percent. The majority of part-time workers were found in the service and agricultural category. Thirty-eight employers who hired sales workers ranked the following three personality traits most frequently as being desired of applicants: (1) ability to meet the public, (2) good attitude, and (3) good personal appearance. The three most frequently mentioned competencies were (1) knowledge of farm products and/or of agricultural marketing procedures, (2) knowledge of farming operations, and (3) the ability to "sell."

3395. WYETH, IRVING RUDOLPH. Status-Role Perceptions in the Taiwan Extension Organization. Dissertation, Ph.D., 1964, Michigan State University. 167 p. Library, Michigan State University, East Lansing.

Purpose.--(1) To determine the attitudes held by status-role groups with respect to how they view the actual structure and functionality of their present organization and their perceptions of expectations and needs for organizational change, and (2) to ascertain whether or not there was consensus between the status-role groups relative to such attitudes and perceptions.

Method.--Role theory was used as the study's theoretical frame of reference. It was hypothesized that status-role groups of the Taiwan extension organization (1) would not hold significantly different attitudes toward the structure and functionality of the present organization and (2) would not significantly differ in their perceptions of expectations and needs for organizational change. It was also hypothesized that there would be no relationship between the consensus on attitudes held toward the present organization and the consensus on perceptions of expectations and needs for organizational change. An attitude scaling schedule composed of 30 statements dealing with organizational and administrative principles applied to the present organization was developed and administered.

The data for the cross-cultural investigational change were collected from four status-role groups, namely, 8 administrators, 14 supervisors, 91 advisors, and 10 specialists. Of these, 46 were interviewed to determine their perceptions of what was expected and believed for organizational change, oriented to each of the four status-role groups and self. Other data were collected by non-directed interview, observation, and document schedules.

Findings.--There was a relatively high degree of inter-group consensus regarding the structure and functionality of the present organization. Such consensus tended to be one of general disagreement to 30 statements which described an effective and efficient organization. There was no significant difference in the consensus between administrators, supervisors, advisors, and specialist groups with respect to 15 of 18 ranked expectations and 12 of 17 ranked needs for organizational change revealed in mixed patterns depending upon particular aspects of organizational and administration in question.

Findings of the study identified areas of inter-group consensus and suggested types of stresses and strains confronting the organization. The implications of the study for the Taiwan Extension Chief and his immediate staff of administrators were (1) improved authority-responsibility relationships, (2) organizational goal achievement, (3) the need for professional improvement programs, (4) improved cooperation and coordination, (5) the carrying out of assigned responsibilities, (6) consideration for the selection of more competent personnel, (7) better planning and decision making, (8) more adequate financial support for extension, (9) and job security.

3396. YOSHIMOTO, STANLEY H. Land Laboratories in the Public Secondary Schools of Hawaii. Thesis, M.Ed., 1965, Oregon State University. 136 p. Department of Agricultural Education, Oregon State University, Corvallis.

Purpose.--(1) To define the meaning of "school land laboratory," (2) to discover the present status of school land laboratories in Hawaii, (3) to conduct a comparative analysis between school land laboratories and school farms, and (4) to identify related problems of school land utilization.

Method.--School farm and land laboratory problems in the State of Hawaii were examined in relation to the problems of school farms and land laboratories throughout the United States. Correlation studies of the various factors involved in the study of Hawaii's land laboratory situation were developed and analyzed. The Rank Order method of computing coefficients was used.

Findings.--Agriculture teachers who cooperated in this study assisted in differentiating school farms from school land laboratories. Dual facilities were reported by a high percentage of the teachers. Teachers from rural schools reported a higher percentage of school land in school farms. Inversely, teachers from urban schools reported a higher percentage of school land in school land laboratory.

Correlation between vocational agriculture enrollment and size and scope of land laboratories and/or school farms resulted in negative coefficients. School farms and land laboratories have served non-agriculture students. Eighty percent of the agriculture teachers served as hosts to students and teachers from other schools. The possibilities for sharing the school land laboratory with science education departments were also shown.

3397. ZIMMERLY, GLENN EVERETT. Selected Training Needs of Students Preparing for Agricultural Missionary Roles. Thesis, M.A., 1964, The Ohio State University. 132 p. Library, The Ohio State University, Columbus.

Purpose.—(1) To determine which courses agricultural missionaries would recommend to prospective personnel preparing for similar work. (2) To determine in which specific areas of responsibility these recommended courses are being used and how they are being used. (3) To determine the preparation, training, and background that agricultural missionaries have at present compared with professional and general agricultural missionaries.

Method.—Questionnaires were sent to 220 agricultural missionaries active in foreign agricultural service who are representatives of Protestant Mission Boards. These missionaries were at work in 56 different countries. The majority of the names on the mailing list were suggested by Agricultural Missions, Inc., 475 Riverside Drive, New York 27, N.Y. The names of individual missionaries were selected by choosing every other name listed under each country where agricultural missionaries were at work. Information sought by the questionnaire included college, seminary, and post-graduate training; occupational background; a rating of all undergraduate agricultural courses as to their degree of helpfulness; activities presently engaged in by agricultural missionaries; and the training needed for these activities.

Findings.—(1) Of the 99 missionaries who replied, 26 percent did not consider themselves to be agricultural missionaries. (2) Only 49 percent had received training in the field of agriculture. (3) Forty-five percent of the professional agricultural missionaries had a M.S. degree, while 50 percent of the missionaries had received seminary or Bible training. (4) The three most important activities of professional agricultural missionaries were "Improving local plants, seeds, animals, and tools," Introducing new varieties of plants, seeds, animals, and tools," and "Conducting agricultural schools." (5) The top ten courses as rated by professional agricultural missionaries were Extension Methods, Poultry Feeds and Feeding, Feeds and Feeding, Rural Sociology, General Horticulture, Poultry Production, Soils, Forage Crops, Field Crop Production, and Livestock Production. (9) "Write-in" courses rated highly by missionaries were entomology, anthropology, plant pathology, agricultural finance, farm buildings, tropical and sub-tropical fruits, and audio-visual aids.

3398. ZIMPEL, JESSE W. Characteristics of Wisconsin Male Youth Employed in Agribusiness and Non-agribusiness Occupations. Thesis, M.S., 1965, University of Wisconsin. 139 p. Department of Agricultural and Extension Education, University of Wisconsin, Madison.

Purpose.--To compare social and educational characteristics of the youth who were engaged in agribusiness with those youth in non-agribusiness occupations. A secondary aspect of these investigations was a modified county-by-county study of the non-agribusiness youth from Manitowoc compared to the non-agribusiness youth from Adams, Iowa, Price, and Polk counties.

Method.--The population consisted of the 1957 male graduates of the following five Wisconsin counties: Adams, Iowa, Manitowoc, Price, and Polk. Data from 430 respondents were studied according to a classification of their occupations. Data used in the study were gleaned from five of the eight questionnaires which had been administered between December 1956 and December 1964 as a part of a longitudinal study. Percentages and arithmetic means were the descriptive techniques used in analysis of the data. Chi square was calculated on several relationships to determine significance.

Findings.--Educational attainment was positively related to the occupation in which the youth were engaged for a livelihood. More of the white-collar workers had attained a bachelor degree or had received some college training than had the blue-collar workers, service workers, or farm workers. The educational level of the blue-collar workers was mainly high school and vocational-technical training. Scholastic achievement in high school was related to occupational classification for both the agribusiness and non-agribusiness youth. Of the youth who had achieved a "B" average or better, nearly 60 percent were white-collar workers. About two out of three farm workers had received less than a "B" average in high school. The highest percentage of agribusiness and non-agribusiness youth with intelligence quotient scores of 110 and above were white-collar workers.

The respondents who were non-farm residents, had two years or less of vocational agriculture, and had not participated in FFA were represented by a high percentage of youth in white-collar occupations.

The youth classified as agribusiness were evenly distributed in each of the occupational classifications, regardless of whether they had been 4-H members or not. A higher percentage of the non-agribusiness youth who were in white-collar occupations had not been 4-H members.

There was little or no relationship between the time of marriage (two years, five years, or eight years out of high school) and the present occupational classification of the youth.

Migration out-of-state was predominately a characteristic of the white-collar workers. The migration of the youth out-of-county was nearly equal for the white-collar and blue-collar workers.

Both the agribusiness and non-agribusiness youth as seniors tended to aspire for occupations unrelated to agriculture.

The definition of agribusiness as used in this investigation, resulted in a heterogeneous grouping of youth in the agribusiness and non-agribusiness categories. Consequently, little difference in the social and educational characteristics existed between the youth of the two major categories.

The data comparing the non-agribusiness youth of Manitowoc to the youth of Iowa, Adams, Price, and Polk counties revealed that Manitowoc tended to have an urbanizing effect on the overall data results. Non-farm residence, two years or less of vocational agriculture in high school, and non-participation in FFA and 4-H were characteristics most representative of the youth from Manitowoc County.

Measured mental ability and scholastic achievement in high school were two variables that were very similar for the youth of the five counties. Manitowoc retained nearly 72 percent of the youth within the home-county compared to about 29 percent retention of the youth in home-county for the combined four counties.

3399. ZURBRICK, PHILLIP RAYMOND. The Academic and Technical Education Needs of Persons Preparing to Teach Agriculture in the Junior College. Thesis, M.Agr.Ed., 1965, University of Arizona. 81 p. Department of Agricultural Education, University of Arizona, Tucson.

Purpose.--To determine the educational preparation of persons presently teaching agriculture on the junior college level in 11 western states, and to access their opinions as to the educational preparation needed by persons preparing to teach agriculture in junior colleges.

The sub-problems were to determine (1) state certification requirements, (2) types of programs offered in agriculture, (3) teaching load, and (4) other responsibilities of teachers presently teaching agriculture at the junior college level in 11 western states.

Method.--Junior colleges offering agriculture in 11 western states were located. Names of agriculture teachers were obtained from catalogues provided by the junior colleges. Questionnaires were sent to each full-time instructor listed in the catalogues as teaching courses in agriculture.

Findings.--There were 34 junior colleges offering one or more agriculture courses in the 11 western states. An additional 32 junior colleges listed agriculture in their catalogues but offered no agricultural courses. California had the largest number of junior colleges offering agriculture. The number of agriculture courses offered in a single junior college ranged from 4 to 74.

The average number of full-time agriculture teachers per college was 2.7. Ninety-nine percent of the teachers held a Bachelor of Science degree and eighty-five percent held a master's degree. The largest, single major field of study was agricultural education, followed by animal science. The largest number of teachers taught in the area of animal science, followed by agronomy, and by soils and fertilizers. The primary duty of junior college agricultural teachers was teaching. Very few teachers reported responsibility for conducting research.

The largest number of teachers in the junior college taught 4 courses per term or semester with an average hour or credit load of 15 hours per week. Over 80 percent of the junior college teachers had had prior teaching experience with over 65 percent having had experience teaching vocational agriculture.

Eighty-five percent of the teachers felt that a master's degree was necessary to be an effective junior college teacher, but all of them felt that farm experience was either necessary or desirable. Over 95 percent felt that courses in student teaching and methods of teaching were necessary or desirable. Four of the eleven western states--Arizona, California, Oregon, and Washington--had published statewide certification requirements for junior college teachers.

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